

SLOCOMB MICROMETERS & Mechanics Tools



CHARLES CHURCHILL & Co.
LIMITED.

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SLOCOMB MICROMETERS

AND
MACHINISTS' TOOLS



CATALOGUE No. 14
ENGLISH EDITION

Manufactured by
J. T. SLOCOMB COMPANY
PROVIDENCE, RHODE ISLAND
U. S. A.



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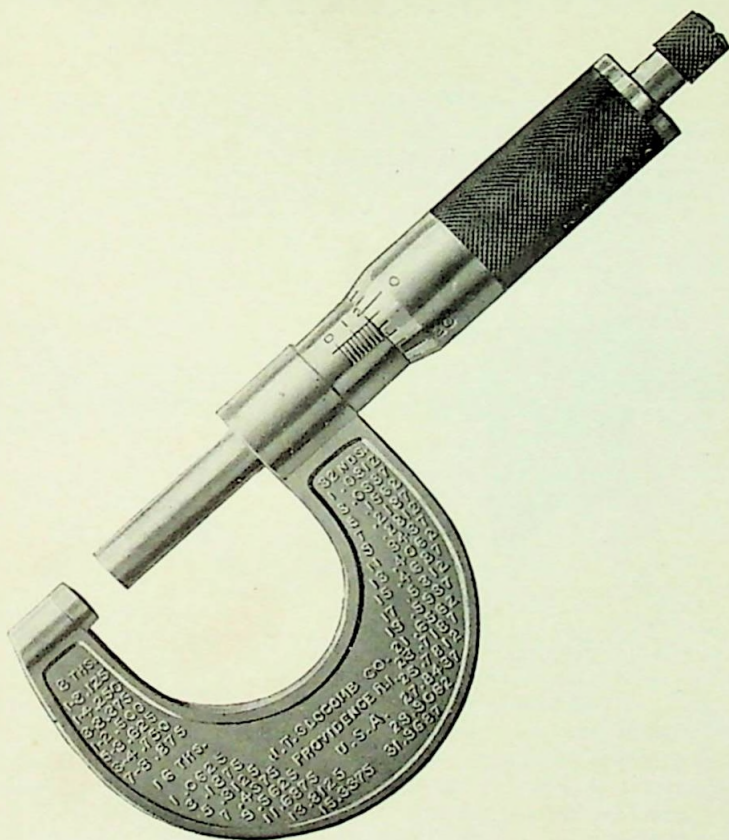
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GUARANTEE

¶ The makers warrant every tool of their manufacture to be of the highest grade of material and workmanship and accurate in every particular. They also warrant them free from any imperfections of materials or defects in workmanship, and should any tool upon use prove defective, they will replace it free of charge.

¶ They fully warrant them equal to any ever made, and desire at all times that customers should have tools which are absolutely right.

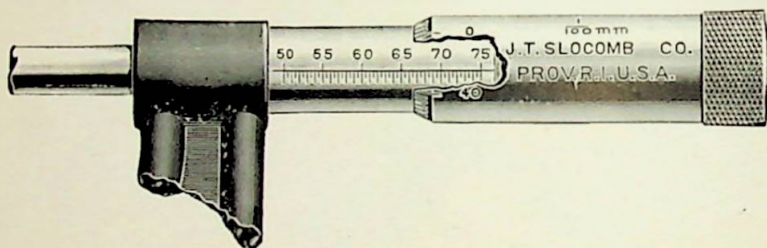
¶ They cannot, however, assume the responsibility for breakage where flaws do not appear, nor can they replace tools which have been abused, or stamped with owner's name, changed, or otherwise experimented upon.



Anybody can measure fairly accurately with a micrometer
 RAPID and ACCURATE work is attained only by practice

Metric Sizes

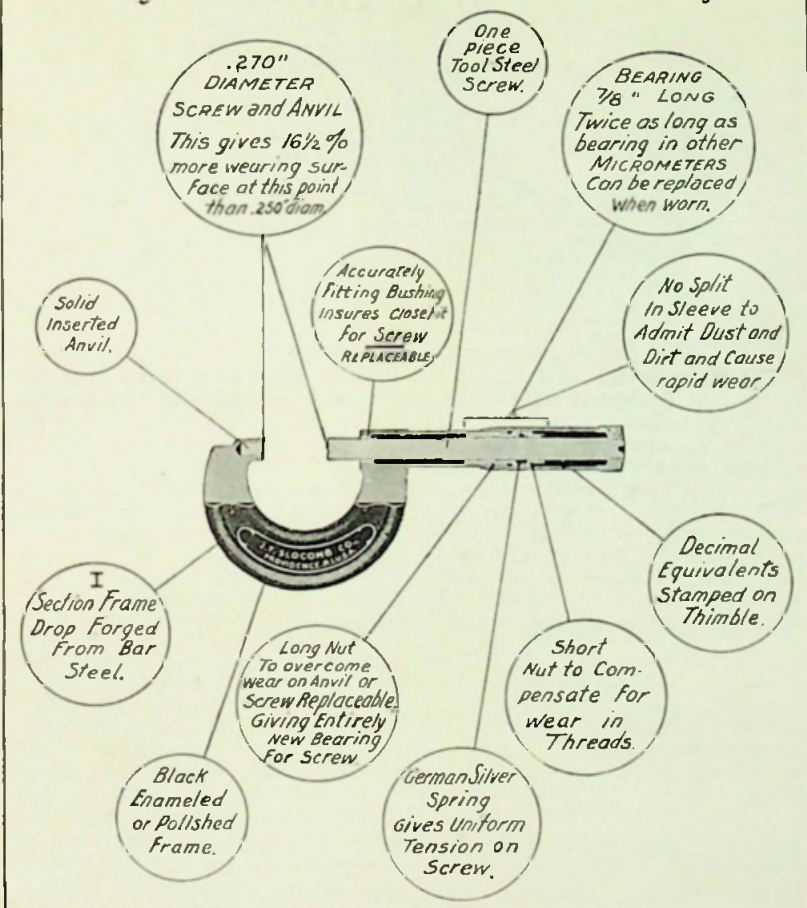
Your attention is called to the Metric Micrometers. While many firms do not work in metric sizes there are others who do, and for this reason we list Micrometers for these measurements.



The above illustration will show the graduations on the barrel of a micrometer for measuring 50 to 75 millimetres. It will be noticed that each division of 5 millimetres is marked to show the **actual** size in millimetres at that point. This makes the Slocomb Metric Micrometer exceedingly easy to read.

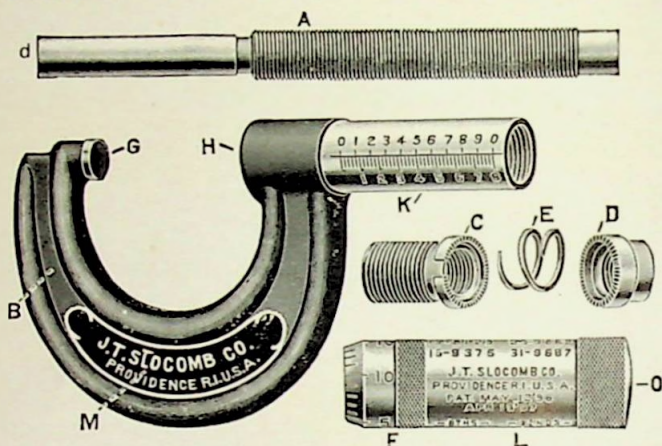
It will be noticed that micrometers for metric measurements are made for all sizes to 750 mm. inclusive, and can be made for larger sizes when desired. See pages 20 to 22. Prices of larger sizes on application.

"The Longest Lived Micrometer That Can Be Bought"



6

Features of the Slocomb Micrometer

**A—Screw or Spindle**

The screw in the Slocomb Micrometer is of the very best quality of high carbon Tool-Steel throughout its entire length, with as high temper as can be machined without annealing. The advantage of this is a solid spindle from one end to the other, and, of course, a Tool-Steel spindle will resist wear much better and longer than a screw made of softer steel with inserted points of Tool-Steel. The end of the screw (d) is hardened.

The Tool-Steel screw running in the soft steel nuts insures the smallest amount of wear and the best running conditions.

The threaded part of the screw is .310" diam. and the portion not threaded is .270" diam. This large diameter gives greater wearing surface for the thread and the point has 16½% more wearing surface than when the screw is .250" diam. Some micrometers have even a smaller spindle than .250" diam.

B—Frame

The frame is drop forged from Bar-Steel, and is I section in shape, making it easy to hold, as well as light. It rests easily in the hand, making pinching unnecessary, and enabling one to make accurate measurements. Pinching is not at all conducive to accurate measurements. The light touch is the accurate touch. The frame is finished in black enamel, which serves to keep the heat away from the tool, thus causing less change, also giving it an attractive appearance and preventing rust.

All sizes to 6 inches inclusive are drop forged from Bar-Steel; the larger sizes being of a high grade Steel Casting.

C and D—Long and Short Adjusting Nuts

These nuts have notched teeth and are used in making adjustments. They form a very important part of the Slocomb Micrometer. It is probably this adjusting feature which has done as much as any other one thing to make the Slocomb Micrometer so particularly attractive.

One of the strong points about this adjustment is the extra life that it gives the tool. A Slocomb Micrometer with this form of adjustment will last a most unusual length of time.

Caution

If the spindle is removed from nuts, see when re-entering that the clutch teeth on nuts C and D are properly in mesh, according to line cut on outside, and held in place till screw enters main nut C; otherwise small nut is liable to be lost up inside thimble.

Adjustment to Overcome Wear on Thread by Meshed Nuts

When the Micrometer is sent out the notched nuts are in mesh, but when the threads on the spindle or in the nuts wear after constant use, adjustment can be made by advancing small nut one, two or more teeth, as required; the thread is stretched this amount and overcomes the wear which has taken place. We call your attention to the fact that the bearing still remains the entire length of the nuts. Note the superiority of this method of adjustment over that of pinching a split shank together at the end, and thus having a bearing of only a few threads.

Fine Adjustment to Overcome Wear on Spindle or Anvil

Instead of turning the anvil up sufficiently to overcome what little wear there might be, we turn the long nut C in or out, as required, to overcome this wear. This moves the spindle forward or backward. When sent out the nut C is screwed home, except one turn which is left for adjustment. The internal thread in nut C is 40 pitch and the external 32 pitch, so that when the parts are in place, turning down nut C advances spindle A the difference in their pitches or .00625 inch per revolution. Moving nut C a distance equal to one of the spaces on the thimble F adjusts the screw .00025 inch.

This makes the best means of adjustment ever applied to a micrometer. It is positive in its action and yet very simple. It is possible to adjust the micrometer easily within .0001 inch.

C—Wearing Thread of Frame

We call particular attention to the long nut, as this is the bearing in which the spindle runs, and should it at any time become damaged or worn, it can be removed and a new nut put in its place, thus giving the Micrometer an entirely new bearing at simply the cost of a new nut. With most micrometers it would be impossible to get a new thread in the frame without purchasing a new frame, which, of course, would mean the purchasing of a new micrometer. This is simply one of the many points in regard to repairing a Slocomb Micrometer that makes it particularly attractive.

E—Spring

This spring is between the two nuts C and D, and keeps them separated as much as the thread will permit, giving a uniform friction, making lock nuts and devices of that sort unnecessary. The screw is never loose at any point, and will not move of its own accord. Incidentally, this spring keeps the spindle back in its seat and does not call for a rigid fit between spindle and nut with its consequent danger of roughing up.

F—Thimble

This thimble is well made, with graduations well and properly marked.

8

G—Anvil

The anvil is inserted solidly in the frame, and is at all times properly in line with the face of the screw. It is never changed, so therefore is not apt to get out of alignment with the screw. The anvil like the end of the screw is .270 inch diameter, giving it a large wearing surface.

H—Steel Bushing

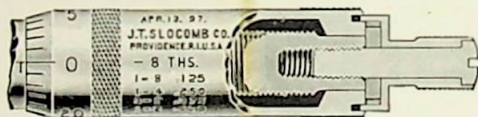
This steel bushing is inserted in the frame and is a close fit on the micrometer screw, giving it a smooth bearing and acting as a positive guide. When worn it can be easily replaced by a new one.

K—Separate Readings for $\frac{1}{8}$ inch. See page 9.

L—Decimal Equivalents. See page 9.

M—Decalcomanias

Micrometers to 6 inch furnished with the black enamel frame have a decalcomania in colours, which gives the frame an attractive appearance.



O—Friction Stop

The above illustration shows the Friction Stop which (when instructed) we put on any of our Micrometers.

This device consists chiefly of a coiled flat spring of german silver. The inner end of this spring is attached to washer, which is clamped to end of thimble by shoulder on central screw. The outer end slides around inside of large bore in outer revolving part, so arranged that in turning to the right the device slides over the spring, but in turning to the left the friction uncoils the spring, causing it to drive positively in this direction. This device has no parts that are liable to get out of order, and allows for a large and substantial screw for attaching; also allows of reducing the knurled part to small diameter, so as to provide a speeder as well.

The german silver spring does not require lubrication, and, as there is so much of it, it will not wear so as to lose its tension.

Another advantage is in the absence of click, which makes a ratchet stop rough in its action, and it does not stop so positively as this friction device.

Price—Extra list on any Micrometer. 2/1

Friction Thimble

On the 1 inch No. 26 Micrometer only we also furnish a friction thimble. See page 15.

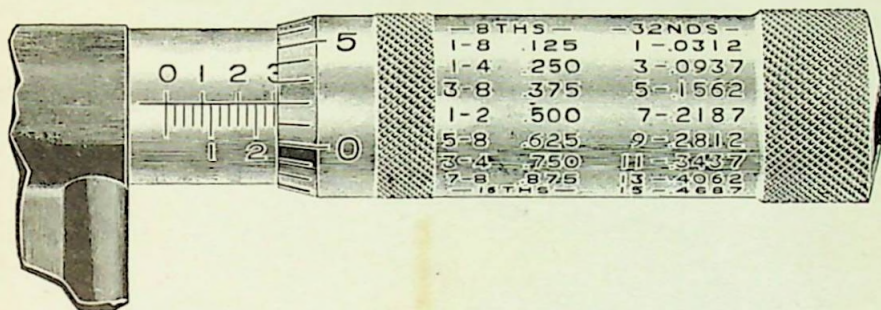


Table of Decimal Equivalents on Thimble

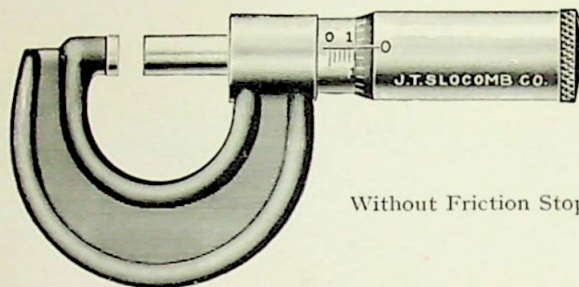
A table of decimal equivalents consisting of 8ths, 16ths, and 32nds is stamped on thimbles of all our Micrometers having the black enamel frame, as per above illustration. This is on all sizes from the 1 inch to the 24 inch inclusive.

One-Eighth Inch Graduations

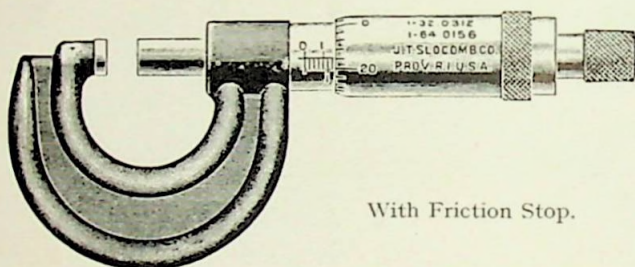
The figures below the reading line of the micrometer show the reading in 8ths. The lines are numbered on the lower side 1 to 8 so that the tool may readily be set by 8ths without considering the decimal graduations.

10

Micrometer Caliper



Without Friction Stop.



With Friction Stop.

No. 22—One-Half Inch

This Caliper measures all sizes from 0 to $\frac{1}{2}$ inch by thousandths of an inch.

This is particularly adapted for a pocket tool on account of its light weight (only $1\frac{1}{4}$ ounces).

Frame is finished in black enamel.

Metric Measure

When instructed we can furnish at same price this Micrometer for measuring 0 to 13 millimetres by hundredths of a millimetre.

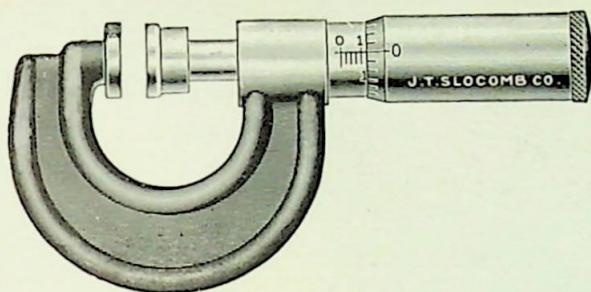
No. 22.	Without Friction Stop.	. . . . .	12-6	14-7
No. 22.	With Friction Stop,	. . . . .	14-7	16-8

Cases for this micrometer are listed on pages 48 and 49.

"THE LONGEST LIVED MICROMETER THAT CAN BE BOUGHT"

Micrometer Caliper

11



No. 24—For Paper

This Caliper is intended for measuring paper or other soft material and has a large anvil and a wide cap on screw, so that when in use it has more bearing on the article being measured.

The frame is drop forged from bar steel and finished in black enamel.

It measures all sizes from 0 to .350 inch by thousandths of an inch.

A feature in this caliper is the removable cap on spindle. This cap is hardened steel and held in place by a small screw passing through, and is fitted somewhat loosely to spindle so it can conform to irregular surface of work.

Metric Measure

When instructed we can furnish at same price Micrometer graduated to read to hundredth millimetres, size 0 to 9 millimetres.

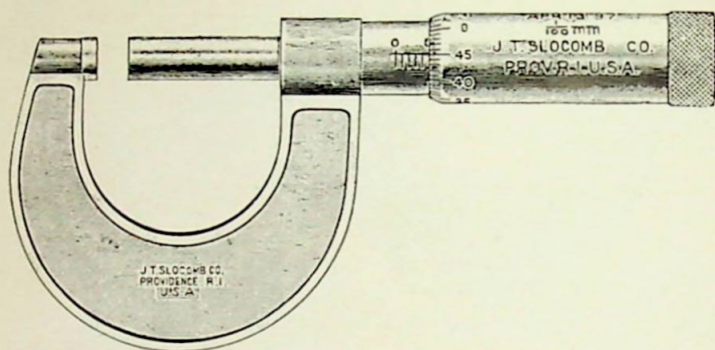
No. 24	Without Friction Stop,	. . . . .	16-8 16-9
No. 24	With Friction Stop,	. . . . .	18-9 20-10

Cases for this micrometer are listed on pages 48 and 49.

"THE LONGEST LIVED MICROMETER THAT CAN BE BOUGHT"

12

Micrometer Caliper



No. 26M Metric 0 to 25 mm.

This Caliper corresponds to the No. 26 English and is furnished like that one with either the friction stop or friction thimble. It is graduated to read in hundredths of a millimetre 0 to 25 millimetres. The frame is plain without any figures and polished.

The frame is drop forged from bar steel.

No. 26M.	Without Friction Stop,	18/9	2010
No. 26M.	With Friction Stop,	20/10	2211
No. 26M.	With Friction Thimble,	22/11	?

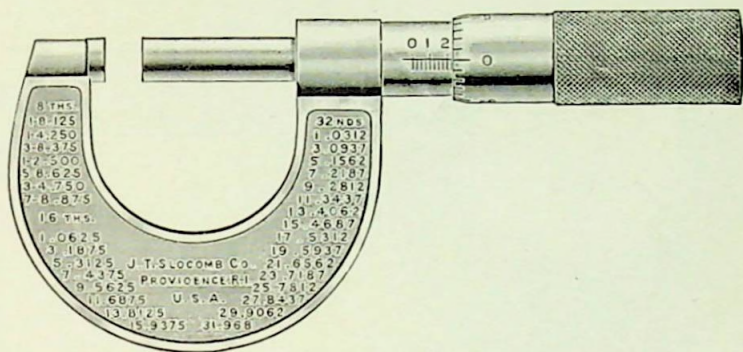
Cases for this micrometer are listed on pages 48 and 49.

For large sizes of Metric Micrometers, see pages 20 to 22.

" THE LONGEST LIVED MICROMETER THAT CAN BE BOUGHT "

Micrometer Caliper

13



No. 26—One Inch

This Caliper like our others is drop forged from bar steel. It is then highly polished and next pressed in polished dies under a hydraulic pressure of 300 tons to the square inch, raising the figures showing decimal equivalents.

The raised edges and figures make a surface that is almost a knurl, and is a good finger hold. The figures are always bright, and show plainly no matter how soiled the frame is permitted to get. This is a distinct advantage when micrometer is in use where dirt cannot be helped. The pressing also stiffens the frame.

This makes a very attractive tool.

Metric Measure

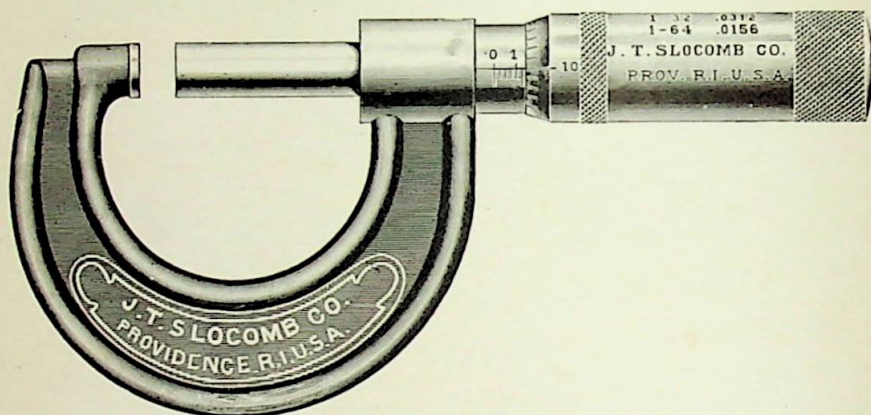
A Micrometer similar to this and at same prices is furnished for measuring 0 to 25 millimetres by hundredths of a millimetre. See page 12.

- | | | |
|--|-------|------------------------|
| No. 26. Without Friction Stop, as above, | . . . | 18-9 20-10 |
| No. 26. With Friction Stop (see page 14), | . . . | 20-10 22-11 |
| No. 26. With Friction Thimble (see page 15), | . . . | 22-11 ? |
| Graduated to read to .0001, extra, | . . . | 4-2 |

Cases for this micrometer are listed on pages 48 and 49.

"THE LONGEST LIVED MICROMETER THAT CAN BE BOUGHT"

Micrometer Caliper



No. 25—One Inch

This Caliper measures all sizes from 0 to 1 inch by thousandths of an inch unless otherwise ordered.

Finished in black enamel. Has drop forged frame of I section style giving strength and rigidity. Decimal equivalents stamped on thimble.

Metric Measure

When instructed we can furnish at same price this micrometer for measuring 0 to 25 millimetres by hundredths of a millimetre.

No. 25. Without Friction Stop, as above,	14/7	16/8
No. 25. With Friction Stop (see page 17).	16/8	18/9
Graduated to read to .0001, extra,	4/2	

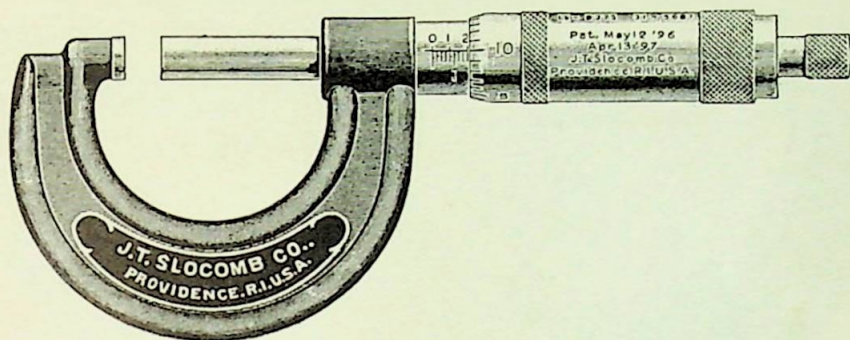
Cases for this micrometer are listed on pages 48 and 49.

For larger sizes, see pages 20 and 21.

"THE LONGEST LIVED MICROMETER THAT CAN BE BOUGHT"

Micrometer Caliper

17



No. 25—One Inch

With Friction Stop

This Micrometer is like the No. 25 listed on preceding page except the addition of the Friction Stop.

This illustration is given to show the appearance of the micrometer with this attachment, and it will serve to show what this attachment will add to any of the outside micrometers listed on the following pages

In all other respects the tool is the same as No. 25.

Metric Measure

When instructed, we can furnish at same price this Micrometer for measuring 0 to 25 millimetres by hundredths of a millimetre.

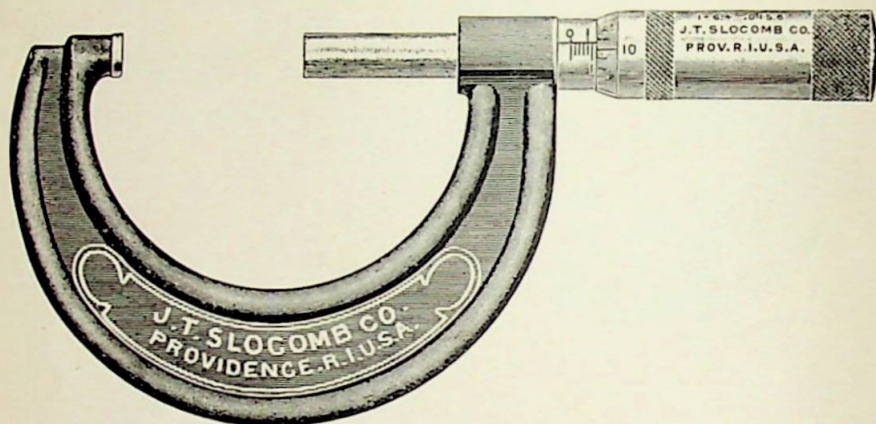
Friction Stop on any outside micrometer, extra, . . .	2 1
No. 25. Without Friction Stop (see page 16), . . .	14-7 16-8
No. 25. With Friction Stop, as above, . . .	16-8 18-9
Graduated to read to .0001, extra, . . .	4 2

Cases for this micrometer are listed on pages 48 and 49.

For larger sizes, see pages 20 and 21.

"THE LONGEST LIVED MICROMETER THAT CAN BE BOUGHT"

Micrometer Caliper



No. 27—Two Inch

This Caliper measures all sizes from 1 to 2 inches inclusive, and like our others is drop forged from bar steel and finished in black enamel, with decimal equivalents stamped on thimble, I section frame, &c. See pages 5 to 9 for description of valuable points about these micrometers.

Metric Measure

When instructed, we can furnish this Micrometer for measuring in hundredths of a millimetre, size from 25 mm. to 50 mm., at same price.

No. 27. Without Friction Stop,	14-7 16-8
No. 27. With Friction Stop,	16-8 18-9
Graduated to read to .0001, extra,	4/2

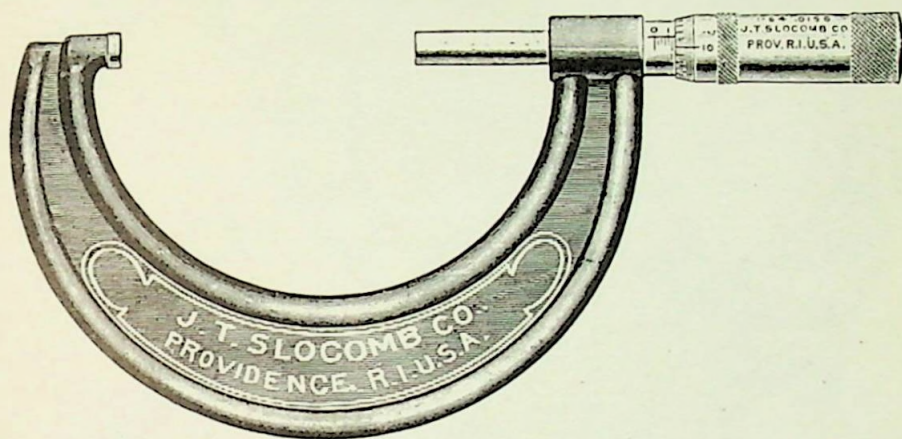
Cases for this micrometer are listed on pages 48 and 49.

For larger sizes, see pages 20 and 21.

"THE LONGEST LIVED MICROMETER THAT CAN BE BOUGHT"

Micrometer Caliper

19



No. 28—Three Inch

This Caliper measures all sizes from 2 to 3 inches by thousandths of an inch. Drop forged from bar steel and finished in black enamel, with decimal equivalents stamped on thimble, I section frame, &c. See pages 5 to 9 for description of valuable points about these micrometers.

Metric Measure

When instructed, we can furnish at same price this Micrometer for measuring in hundredths of a millimetre from 50 to 75 millimetres.

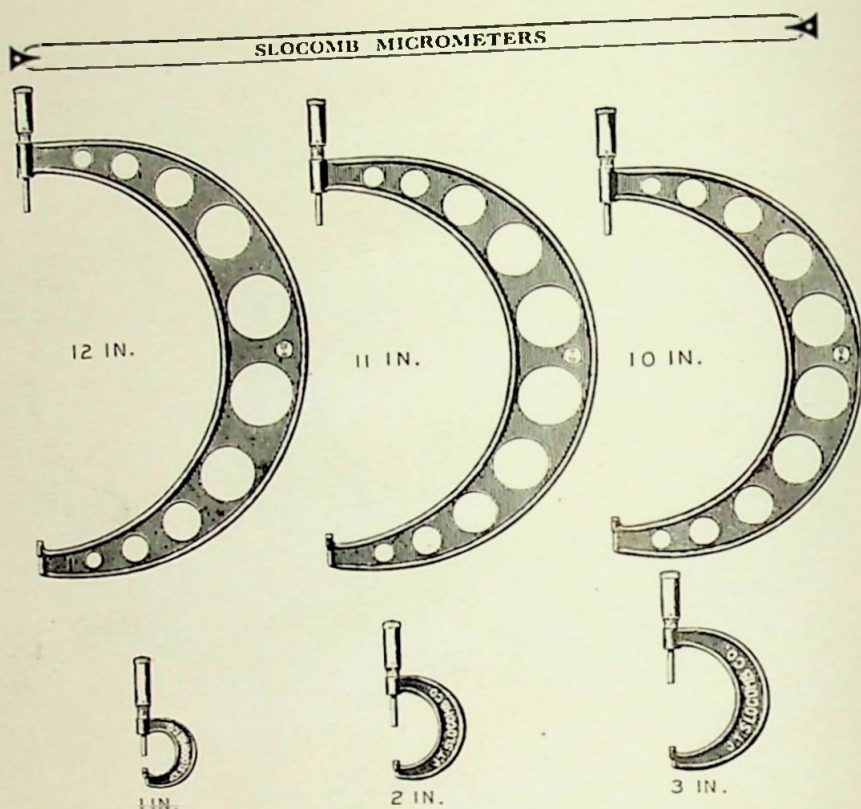
No. 28. Without Friction Stop,	20/10
No. 28. With Friction Stop,	22/11
Graduated to read to .0001, extra,	4/2

Cases for this micrometer are listed on pages 48 and 49.

For larger sizes, see pages 20 and 21.

"THE LONGEST LIVED MICROMETER THAT CAN BE BOUGHT"

20



We list here Micrometers having a range of one inch for each size, covering all sizes to 24 inches inclusive.

The frames on sizes 1 to 6 inches inclusive are drop forged from bar steel, and sizes 7 inches and larger are of high grade steel castings with holes through them for lightness.

The heads and measuring screws on all are the same. Each has a range of screw of one inch.

The size given on the illustration shows the maximum, the minimum being one inch less in each case.

Frames are finished in black enamel. Micrometers for English measurement sent unless otherwise instructed.

The six large sizes (19 inches to 24 inches) are late additions to the list and we feel sure these large sizes will be welcomed by many.

Metric Measure

When desired, we can furnish at same prices any of these Micrometers graduated to read to hundredths of a millimetre. Each Metric Micrometer has a range of 25 millimetres.

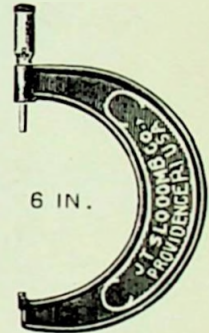
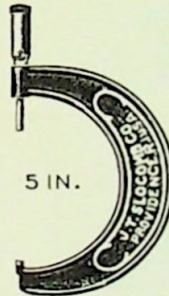
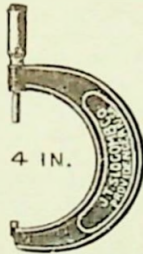
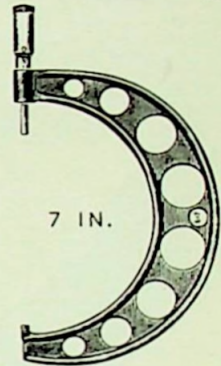
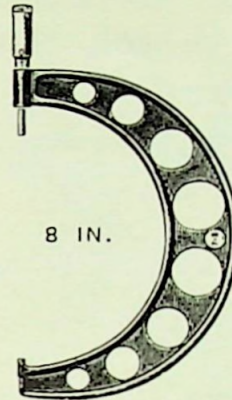
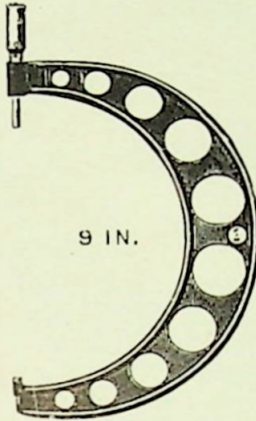
For detailed description of these Micrometers, see pages 5 to 9.

These Micrometers are put up in sets containing different sizes; see pages 28 to 35 inclusive.

"THE LONGEST LIVED MICROMETER THAT CAN BE BOUGHT"

Micrometer Calipers from 1 to 24 Inches

21

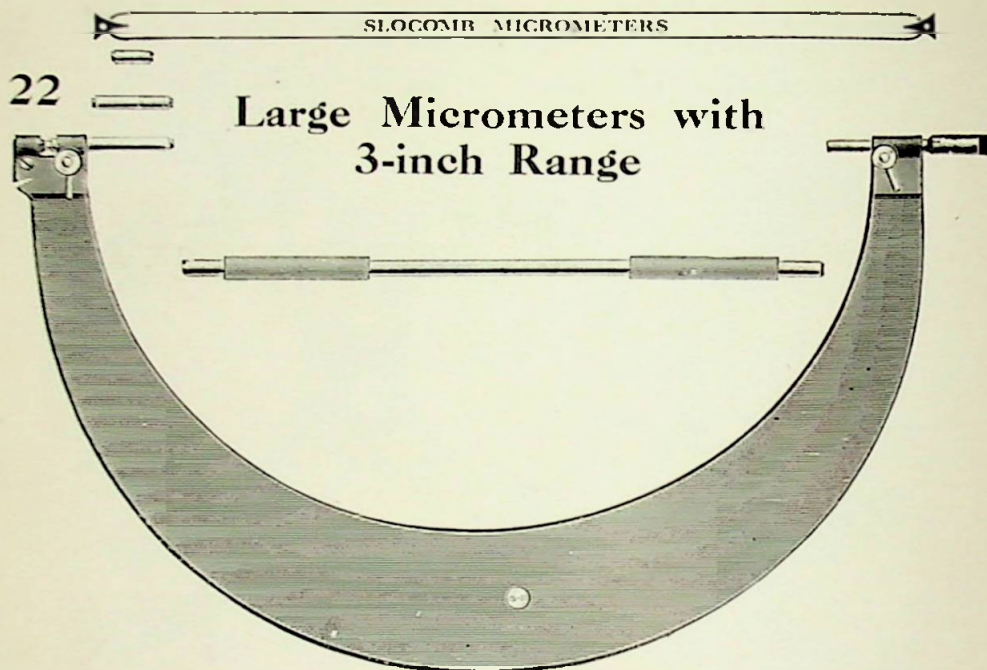


Inches.	Metric.	Without Friction Stop.	Inches.	Metric.	Without Friction Stop.
0 to 1	0 to 25	14 7	12 to 13	300 to 325	41 8
1 to 2	25 to 50	14 7	13 to 14	325 to 350	43 9
2 to 3	50 to 75	20 10	14 to 15	350 to 375	45 10
3 to 4	75 to 100	23 -	15 to 16	375 to 400	48 -
4 to 5	100 to 125	25 -	16 to 17	400 to 425	50 -
5 to 6	125 to 150	27 1	17 to 18	425 to 450	52 1
6 to 7	150 to 175	29 2	18 to 19	450 to 475	56 3
7 to 8	175 to 200	31 3	19 to 20	475 to 500	60 5
8 to 9	200 to 225	33 4	20 to 21	500 to 525	64 7
9 to 10	225 to 250	35 5	21 to 22	525 to 550	68 9
10 to 11	250 to 275	37 6	22 to 23	550 to 575	73 -
11 to 12	275 to 300	39 7	23 to 24	575 to 600	77/1

Friction Stop for any of the above, 2/1 extra.

Any of above Micrometers to 6 inches inclusive graduated to read to .0001 inch, 4/2 extra

" THE LONGEST LIVED MICROMETER THAT CAN BE BOUGHT "



The illustration shows a Caliper we make in sizes above 18 inches English and 450 millimetres Metric. The frame is a steel forging. Each tool is provided with three End Measure Anvils, a 1-inch, 2-inch and 3-inch (or 25, 50 and 75 mm. in case of metric), which are held by split clamp and rest against adjusting screw. Also one Standard End Measure, as shown in illustration. A feature of this tool is in the gap, allowing face of End Measure and adjusting screw to be wiped clean before contact is made, and then allowing for inspection by sighting through at any time. This tool is also provided with clamp for locking spindle in any desired position. The frame is finished in black enamel.

We list and carry in stock the four sizes given below, each having a range of 3 inches English or 75 millimetres Metric, but call attention that we can furnish on special orders this style of micrometer in larger sizes. Prices on application.

The first two sizes given duplicate single micrometers of inch range listed on pages 20 and 21, but while we recommend the inch range tools where there is any considerable use, we are prepared to furnish either.

Metric Measure

Micrometers of this style for measuring in hundredths of a millimetre can be furnished at same prices.

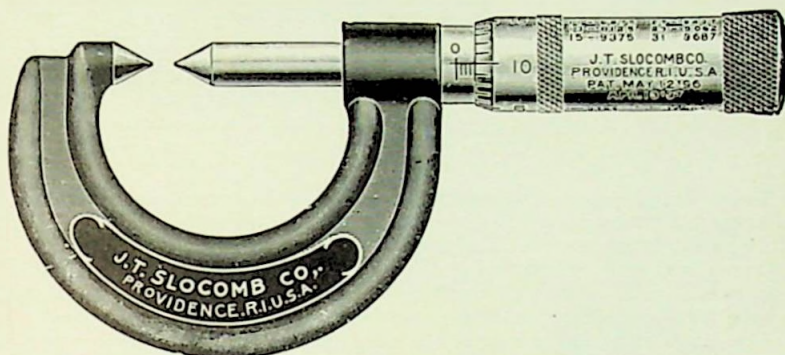
	English.	Metric.		
No. 51.	18 to 21 inches ;	450 to 525 mm.,	£6-13-4	7-10-0
No. 52.	21 to 24 inches ;	525 to 600 mm.,	7-5-10	8-6-8
No. 53.	24 to 27 inches ;	600 to 675 mm.,	8-6-8	9-7-6
No. 54.	27 to 30 inches ;	675 to 750 mm.,	9-7-6	10-8-4

For sizes 21 inches and less with inch range, see pages 20 and 21.

"THE LONGEST LIVED MICROMETER THAT CAN BE BOUGHT"

Micrometer Caliper

23



No. 29

This Caliper will not measure the actual diameter of a V thread screw, but for purposes of comparison it has a wide range of uses.

It is valuable for making a tap same diameter as some other tap or screw, or a few thousandths larger or smaller.

For cutting screw threads in the lathe to fit nuts the tap may be measured and then the threads readily cut to same size and to fit nuts, without the common cut and try method and its consequent loss of time.

The terminals are not made to a sharp point, but instead are flattened to about $\frac{1}{16}$ inch diameter, and the tool is adjusted to 0 when these flat points are in contact, so it may be used same as any other micrometer when it is desired to measure at the bottom of a groove or a small recess, the thickness in the centre of twist drills, or similar work.

Frame finished in black enamel.

Metric Measure

When instructed, we can furnish at same prices this style micrometer for measuring in hundredths of a millimetre.

	English.	Metric.	
No. 29 A. Without Friction Stop, ..	0 to 1 inch,	0 to 25 mm., ..	16-8 16-9
No. 29 B. With Friction Stop, ..	0 to 1 inch,	0 to 25 mm., ..	18-9 20-10
No. 29 C. Without Friction Stop, ..	1 to 2 inch,	25 to 50 mm., ..	18-9 "
No. 29 D. With Friction Stop, ..	1 to 2 inch,	25 to 50 mm., ..	20-10 22-11
No. 29 E. Without Friction Stop, ..	2 to 3 inch,	50 to 75 mm., ..	25- 27-1
No. 29 F. With Friction Stop, ..	2 to 3 inch,	50 to 75 mm., ..	27-1 29-2

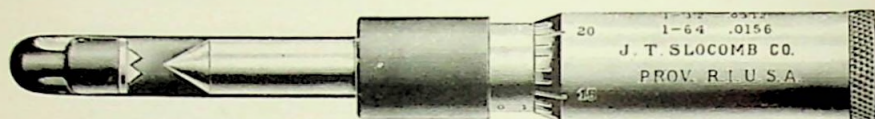
For larger sizes, add 4 2 to regular list as given on pages 20 and 21.

Micrometers for English measurement sent unless otherwise ordered.

Cases for these micrometers are listed on pages 48 and 49.

" THE LONGEST LIVED MICROMETER THAT CAN BE BOUGHT "

Standard Screw Thread Micrometer

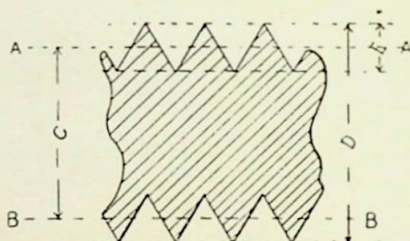


No. 30

These Screw Thread Micrometers provide the best means known for the accurate measuring of screw threads, whether it be on taps, screws, bolts or any other form having a screw thread.

Our Micrometer is especially adapted on account of all the adjustments being made inside the thimble and we are able to use a solid anvil, which is much more reliable than when this piece is fitted loose.

The anvil is V shaped, and the end of the screw pointed. The V in the anvil is sharp enough and the pointed end of the screw flattened enough so that they will not rest on the top or bottom of the thread being measured, but instead will rest only on the angle or cut surface of the thread. It is a well known fact that the outside diameter has little to do with the actual size of a screw, and this Micrometer provides a way of making the actual measurement on the angle.



Referring to the small sectional illustration: **A-B** are the pitch lines of the thread and **C** is the measurement which is shown by these Micrometers. This is the diameter, less one half the total depth of thread or one depth of thread less than the outside diameter.

This depth may be found as follows:—

Depth of V threads	= .866 ÷ number of threads to 1 inch.
Depth of U. S. S. threads	= .6495 ÷ number of threads to 1 inch.
Depth of Whitworth threads	= .640 ÷ number of threads to 1 inch.
Depth of A. S. M. E. threads	= .6495 ÷ number of threads to 1 inch.
Depth of British Asso. threads	= .60 ÷ number of threads to 1 inch.
Depth of Metric threads	= .6495 ÷ number of threads to 1 inch.

For table of constants for threads, see page 62.

"THE LONGEST LIVED MICROMETER THAT CAN BE BOUGHT"

The movable point will measure any pitch, but the fixed anvil is limited to its capacity, for if made large enough to measure a 6 pitch thread it would be too wide at the top to measure a 20 pitch.

The anvil therefore governs the range of the micrometer and it will be seen that a micrometer will measure much larger sizes than its range, but in practice this small anvil is hard to handle and it is found better to use a number of different size anvils; the exact number required is a matter of opinion, but for the sake of having some standard we recommend the following:—

No. 30 A. $\frac{1}{2}$ inch, capacity 0 to $\frac{1}{2}$ inch, range 48 to 64 pitch, V threads only,	20-10	22-11
No. 30 C. 1 inch, capacity 0 to 1 inch, range 8 to 13 pitch, V, U. S. S., or Whitworth threads,	25	27-1
No. 30 E. 1 inch, capacity 0 to 1 inch, range 14 to 20 pitch, V, U. S. S., or Whitworth threads,	25	27-1
No. 30 G. 1 inch, capacity 0 to 1 inch, range 22 to 30 pitch, V threads only,	25	27-1
No. 30 J. 1 inch, capacity 0 to 1 inch, range 32 to 40 pitch, V threads only,	25	27-1
No. 30 L. 2 inch, capacity 1 to 2 inch, range 4 $\frac{1}{2}$ to 7 pitch, V, U. S. S., or Whitworth threads,	20-2	31-3
No. 30 P. 3 inch, capacity 2 to 3 inch, range and pitch as ordered,	31-3	33-4
Micrometers with range differing from above, extra list,		2-1
Large size Micrometers with range as ordered, add to list of regular micrometers, pages 20 and 21, extra,	8-4	12-6

Cases for these micrometers are listed on pages 48 and 49.

Micrometers for any other forms of threads made to order; price on application.

Metric Sizes

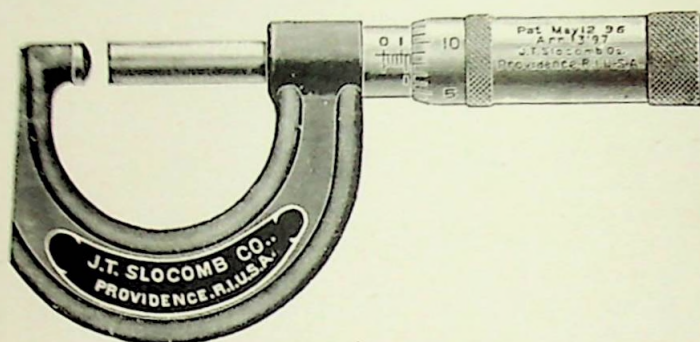
When instructed, we can furnish at same prices any of these micrometers graduated to read in hundredths of a millimetre for measuring metric threads.

For table of constants for threads, see page 62.

When ordering, specify form of thread to be measured.

" THE LONGEST LIVED MICROMETER THAT CAN BE BOUGHT "

Tube Micrometer



No. 31

This tool is intended for measuring the walls of tubes and the anvil end is shortened so that it may be used on tubes of small diameters. The anvil will enter a hole $\frac{1}{16}$ inch diameter to a depth of $\frac{1}{4}$ inch.

It is also useful on jig-work in testing distance of holes from edge, and other similar work.

The anvil is rounded so that it will rest accurately on the inside surface of the tube.

Metric Measure

When instructed, we can furnish at same prices any of the following Micrometers for measuring in hundredths of a millimetre.

	English.	Metric.	
No. 31 A. Without Friction Stop, ..	0 to $\frac{1}{4}$ inch.	0 to 13 mm., ..	12-6 14-7
No. 31 B. With Friction Stop, ..	0 to $\frac{1}{4}$ inch.	0 to 13 mm., ..	14-7 16-8
No. 31 C. Without Friction Stop, ..	0 to 1 inch.	0 to 25 mm., ..	14-7 "
No. 31 D. With Friction Stop, ..	0 to 1 inch.	0 to 25 mm., ..	16-8 18-9
No. 31 E. Without Friction Stop, ..	1 to 2 inch.	25 to 50 mm., ..	16-8 "
No. 31 F. With Friction Stop, ..	1 to 2 inch.	25 to 50 mm., ..	18-9 20-9

For larger sizes add 2 1 to regular list as given on pages 20 and 21.

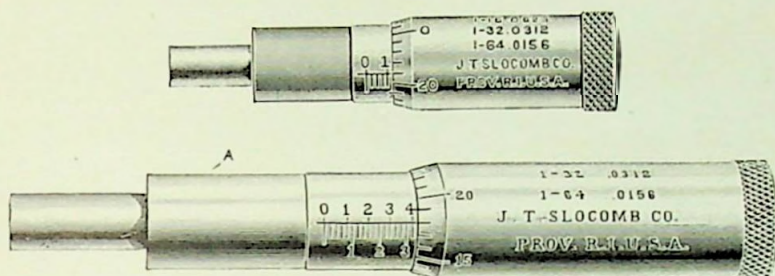
Micrometers for English measurement sent unless otherwise ordered.

Cases for these micrometers listed on pages 48 and 49.

"THE LONGEST LIVED MICROMETER THAT CAN BE BOUGHT"

Micrometer Head

27



No. 32

These Micrometer Heads are useful for purposes of fine adjustments in tools or machines. They are intended to be fastened by sweating in with soft solder or split clamp. We carry in stock heads as shown in the illustrations.

The diameter A on the $\frac{1}{2}$ inch head is $\frac{3}{4}$ inch and the length is $1\frac{1}{2}$ inch from end of barrel to shoulder. The diameter A on the 1 inch head is $\frac{7}{8}$ inch and the length is $\frac{3}{4}$ inch from end of barrel to shoulder.

As the adjusting screw in our Micrometer, for wear on end of screw and anvil, is inside the thimble, our Micrometer Heads are complete with adjustments, making them especially suited for such a purpose.

These heads have a range of $\frac{1}{2}$ inch and 1 inch and are regularly graduated to read to thousandths of an inch, but, when desired, the 1 inch head can be furnished graduated to read to ten thousandths of an inch.

Either head can be furnished with friction stop.

Metric Measure

When desired, we can furnish at same prices these Micrometer Heads graduated to read in hundredths of a millimetre. They have a range in metric sizes of 13 and 25 millimetres respectively.

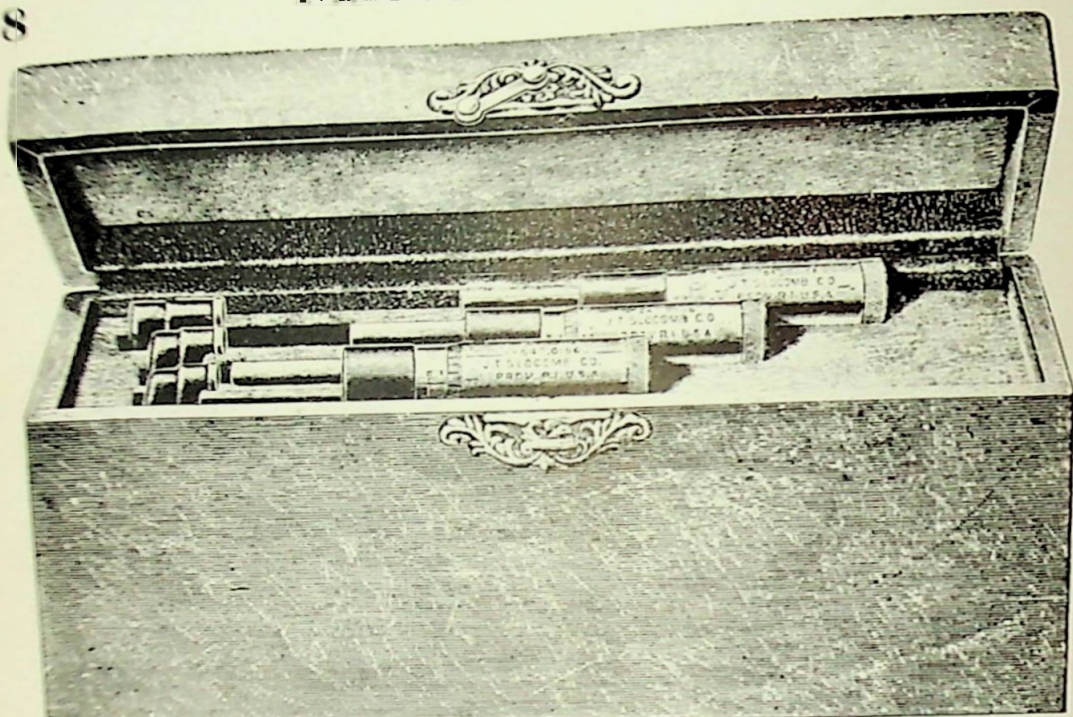
	English.	Metric.	
No. 32 A.	Without Friction Stop.	0 to $\frac{1}{2}$ inch,	0 to 13 mm. . . 10/5
No. 32 B.	With Friction Stop. . .	0 to $\frac{1}{2}$ inch,	0 to 13 mm. . . 12/6
No. 32 C.	Without Friction Stop.	0 to 1 inch,	0 to 25 mm. . . 12/6
No. 32 D.	With Friction Stop. . .	0 to 1 inch,	0 to 25 mm. . . 14/7

Micrometer Heads for English measurements sent unless otherwise ordered.

"THE LONGEST LIVED MICROMETER THAT CAN BE BOUGHT"

Micrometer Set

28



No. 18—0 to 3 Inches

This set provides an inexpensive yet serviceable set of micrometers with a range from 0 to 3 inches. The micrometers are all of the regular style, as shown singly on other pages of this catalogue.

Each micrometer is graduated to read to thousandths of an inch, although they can, when so ordered, be graduated to read to ten thousandths of an inch, at an extra list of 4.2 for each micrometer, or 12.6 extra per set.

Furnished in a handsome, substantial case, covered with morocco leather and velvet lined. Dimensions, $8\frac{1}{2} \times 3 \times 4\frac{1}{2}$ inches.

These are regularly sent without friction stops unless otherwise ordered.

Metric Measure

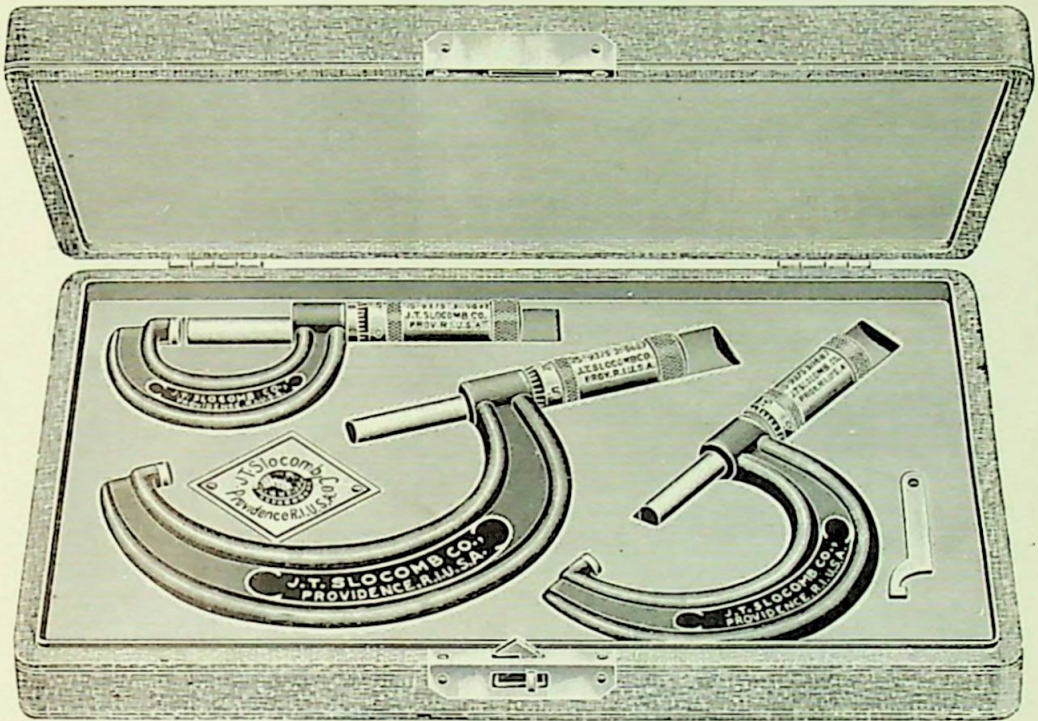
This set is also furnished with micrometers measuring 0 to 75 millimetres by hundredths of a millimetre at same price.

Price complete, without Friction Stops, . . .	£2-15-6	2-19-7
Price complete, with Friction Stops, . . .	3-1-9	3-5-10
Price, Case only,	0 5 3	

"THE LONGEST LIVED MICROMETER THAT CAN BE BOUGHT"

Micrometer Set

29



No. 21—0 to 3 Inches

The illustration gives a very good idea of this ideal set of three micrometers with a range from 0 to 3 inches. All the micrometers are of the regular style, as listed singly on other pages.

Each micrometer is graduated to read to thousandths of an inch, although they can be furnished, when desired, graduated to read to ten thousandths of an inch, at an extra list of $4\frac{1}{2}$ for each micrometer, or $12\frac{1}{6}$ extra per set.

The micrometers lay flat in a handsome velvet-lined morocco-covered case. Dimensions, $9\frac{1}{2} \times 6\frac{3}{4} \times 1\frac{1}{2}$ inches.

These are furnished, unless otherwise ordered, without friction stops.

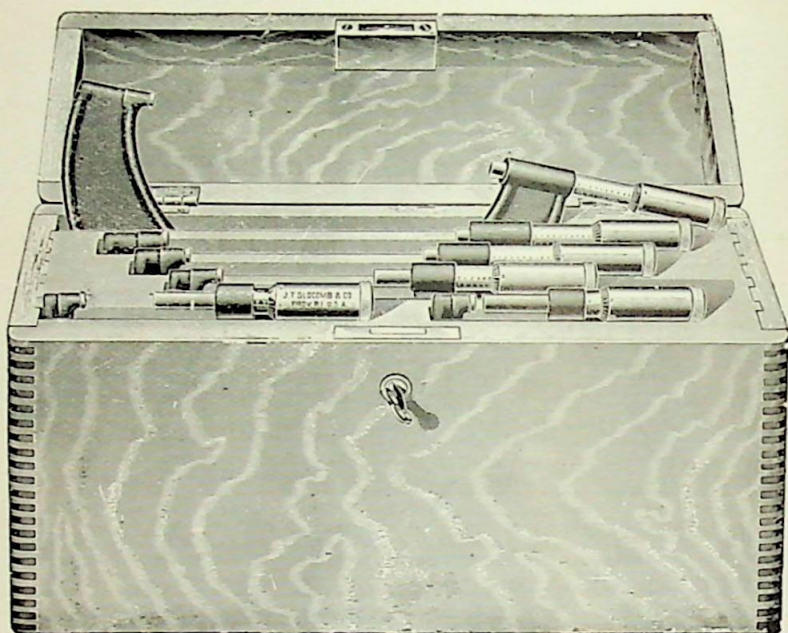
Metric Measure

This set is also furnished with micrometers measuring 0 to 75 millimetres by hundredths of a millimetre at same price.

Price complete, without Friction Stops, . . .	£2 15 6	2-19-7
Price complete, with Friction Stops, . . .	3 1 9	3-5-10
Price, Case only,	0 5 3	

"THE LONGEST LIVED MICROMETER THAT CAN BE BOUGHT"

Micrometer Set



No. 19—0 to 6 Inches

This set consists of one each of the regular micrometers as listed singly on pages 20 and 21, 1, 2, 3, 4, 5, and 6 inches, and makes an excellent set for inspection or general shop use.

Each micrometer is graduated to read by thousandths of an inch, although they can be furnished, when so desired, graduated to read to ten thousandths of an inch, at an extra list of 4 2 for each micrometer, or 25 extra per set.

The micrometers are set with the frame down in the case, all being on an even plane at the top of the case. The case itself is of quartered oak, beautifully finished, and having lock and key. Dimensions, $14\frac{1}{2} \times 5\frac{1}{4} \times 7$ inches.

Micrometers furnished, unless otherwise ordered, without friction stop.

Metric Measure

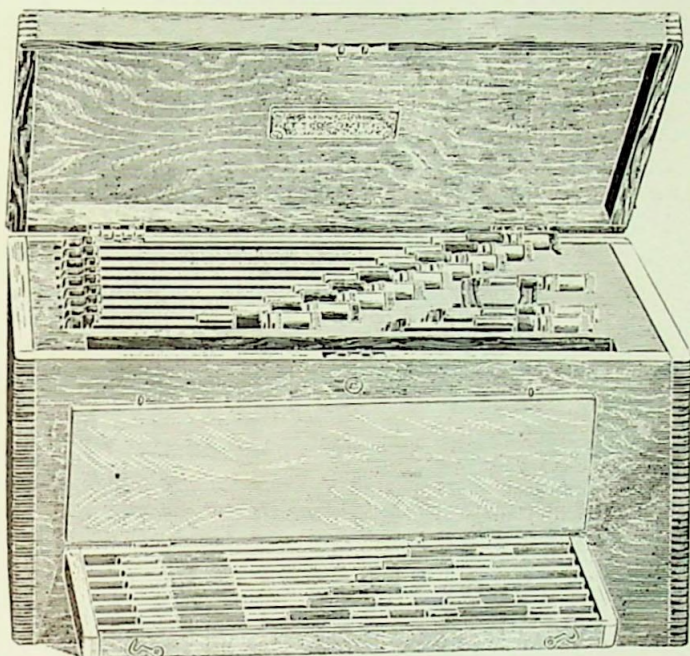
This set is also furnished with micrometers measuring 0 to 150 millimetres by hundredths of a millimetre, at same prices.

Price complete, without Friction Stops.	£7 3 9	7-10-0
Price complete, with Friction Stops,	7 16 3	8-2-6
Price, Case only.	0 13 7	

"THE LONG LIVED MICROMETER THAT CAN BE BOUGHT"

Micrometer Set

31



No. 22 0 to 12 Inches

This set is similar to set No. 20 listed on page 32, and consists of twelve micrometers, 1 to 12 inches, giving a range from 0 to 12 inches inclusive, and a set of 12 end measures, 1 to 12 inches inclusive, but is packed in a handsomely finished quartered oak case.

It makes a fine set for inspection or tool room use.

Each micrometer is graduated to read in thousandths of an inch.

The end measures are contained in a separate quartered oak case (shown in front of large case) and this case fits in pocket in front of large case.

Dimensions of large case closed, $20\frac{1}{2} \times 13\frac{1}{2} \times 11$ inches.

These cases have an advantage over the racks in keeping the tools free from dirt.

Micrometers furnished, unless otherwise ordered, without friction stops.

Metric Measure

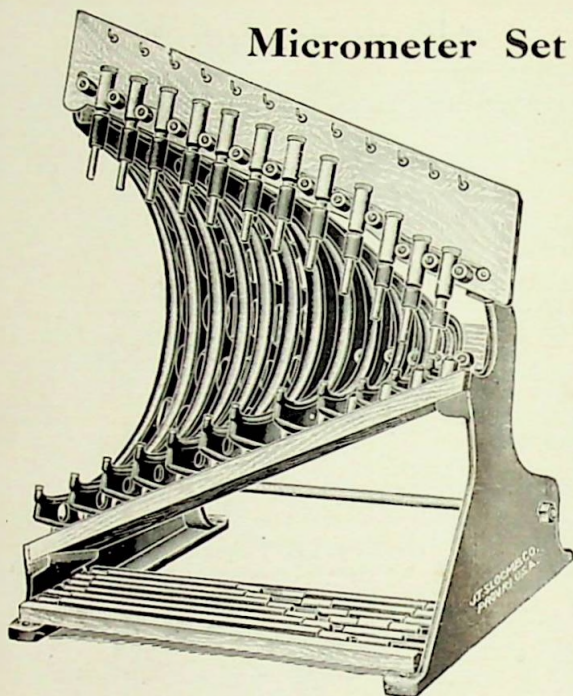
This set is also furnished with micrometers measuring 0 to 300 millimetres by hundredths of a millimetre, at same prices.

Price complete, without Friction Stops, . . .	£21-17-6	24-0-10
Price complete, with Friction Stops, . . .	23-2-6	25-5-10
Price, Case only, . . .	1	

"THE LONGEST LIVED MICROMETER THAT CA"

BOUGHT"

Micrometer Set



No. 20—0 to 12 Inches

This set consists of twelve micrometers, one each 1 inch to 12 inches, giving a range from 0 to 12 inches inclusive, as listed singly on pages 20 and 21, and is a very advisable set for tool room or general factory use.

Each micrometer is graduated to read in thousandths of an inch.

The rack is made with cast iron ends, black enamelled finish with oak slats. The partitions are rubber buttons which keep the tools separated, and yet are not injurious to them. Hooks are provided above each tool for workman's check.

The lower oak slat is grooved, and contains set of 12 end measures from 1 to 12 inches inclusive.

The rack is 21 $\frac{1}{2}$ inches high with a base dimension of 15 $\frac{3}{4}$ x 13 inches. Your tool room is not complete without this set.

Micrometers furnished, unless otherwise ordered, without friction stops.

Metric Measure

This set is also furnished with micrometers measuring 0 to 300 millimetres by hundredths of a millimetre, at same prices.

Price complete, without Friction Stops, . . . £21-3-0 25-6-3

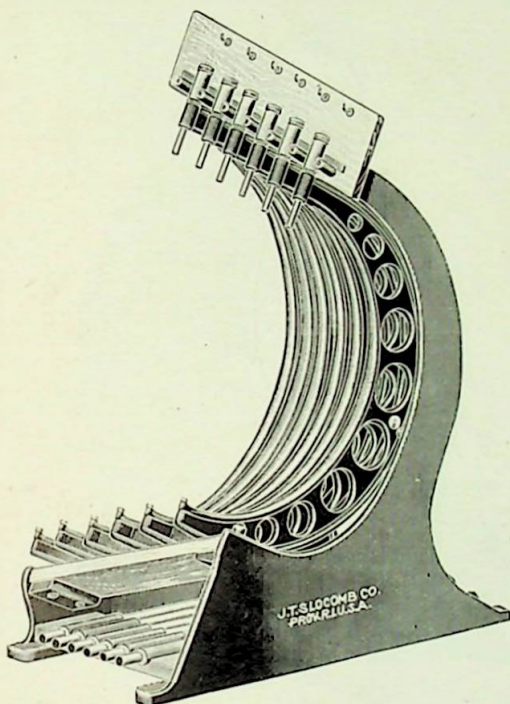
Price complete, with Friction Stops, . . . 22-8-0 26-11-3

Price, Rack only, . . . 1 0 10

"THE LONGEST LIVED MICROMETER THAT CAN BE BOUGHT"

Micrometer Set

33



No. 24—12 to 18 Inches

This set consists of six micrometers and six end measures, measuring from 12 to 18 inches inclusive, and, with the set No. 20 listed on page 32, gives a range from 0 to 18 inches.

Each micrometer is graduated to read in thousandths of an inch.

The rack is made with black enamelled cast iron sides with oak slats and rubber button partitions. Hook above each tool for workman's check. End measures are kept on lower slat, which is grooved for the purpose. The rack is $27\frac{1}{2}$ inches high, and has base dimensions of $19\frac{1}{2} \times 9\frac{1}{2}$ inches. Micrometers furnished without friction stops, unless otherwise ordered.

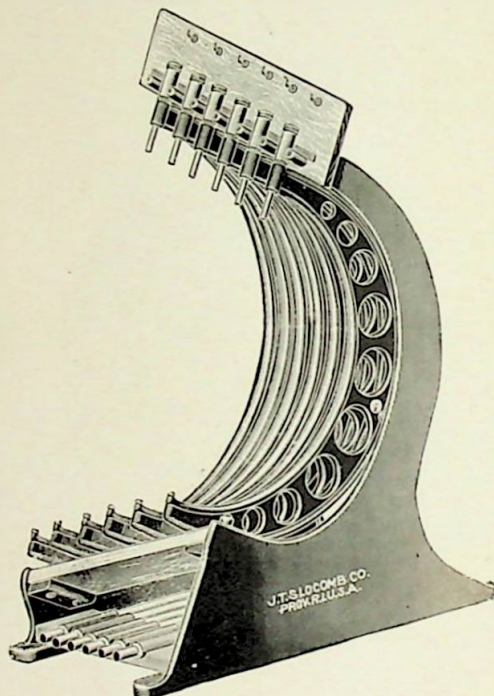
Metric Measure

This set is also furnished when so desired with micrometers measuring 300 to 450 millimetres by hundredths of a millimetre, at same prices.

Price complete, without Friction Stops, . . .	£18-10-2	25-2-1
Price complete, with Friction Stops, . . .	19-11-8	25-14-7
Price, Rack only,	1 8 2	

"THE LONGEST LIVED MICROMETER THAT CAN BE BOUGHT"

Micrometer Set



No. 26—18 to 24 Inches

This set consists of six micrometers and six end measures measuring from 18 to 24 inches inclusive, and, with set No. 20 listed on page 32 and set No. 24 listed on page 33, gives a range 0 to 24 inches. They will be found valuable for manufacturers whose work comes within this range.

Each micrometer is graduated to read in thousandths of an inch.

The rack is made with black enamelled cast iron sides with oak slats and rubber partitions. Hook above each tool for workman's check.

End measures are kept on lower slat, which is grooved for this purpose.

The rack is 33 1/2 inches high and has base dimensions of 11 1/2 x 26 inches. Micrometers furnished without friction stops, unless otherwise ordered.

Metric Measure

This set is also furnished when so desired with micrometers measuring 450 to 600 millimetres by hundredths of a millimetre, at same prices.

Price complete, without Friction Stops, . . . ~~£28 2 6~~ 36-5-0

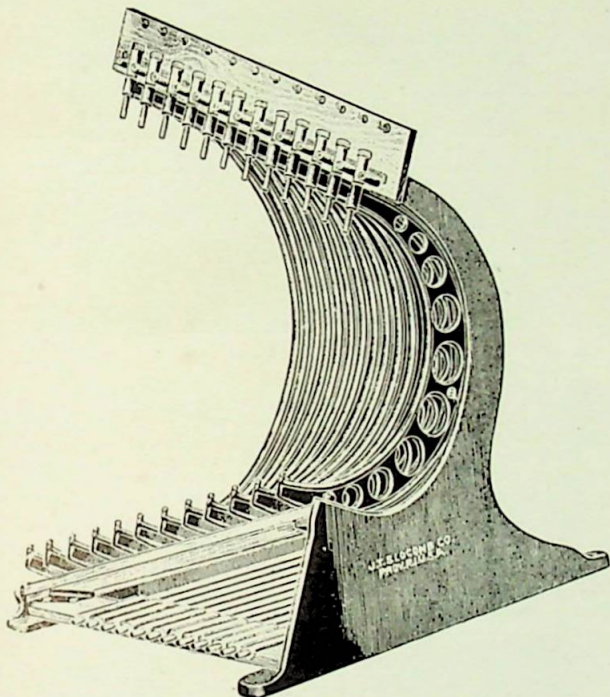
Price complete, with Friction Stops, . . . ~~28 15 0~~ 36 17-6

Price, Rack only, . . . 1 16 0

"THE LONGEST LIVED MICROMETER THAT CAN BE BOUGHT"

Micrometer Set

35



No. 28—12 to 24 Inches

This set is a combination of sets No. 24 and No. 26 as listed on pages 33 and 34, and consists of twelve micrometers and twelve end measures from 12 to 24 inches inclusive, all furnished on one rack. This set in connection with set No. 20 listed on page 32 gives a range 0 to 24 inches.

Each micrometer is graduated to read in thousandths of an inch.

The rack is made with black enamelled cast iron sides with oak slats and rubber partitions. Hook above each tool for workman's check.

End measures are kept on lower slat, which is grooved for the purpose.

This rack is 33½ inches high and has base dimensions of 17½ × 26 inches.

Micrometers furnished without friction stops, unless otherwise ordered.

Metric Measure

This set is also furnished when so desired with micrometers measuring 300 to 600 millimetres by hundredths of a millimetre, at same prices.

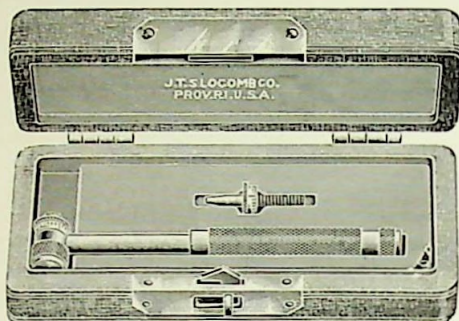
Price complete, without Friction Stops, . . . ~~£45 16 8~~ 60-2-1

Price complete, with Friction Stops, . . . ~~47 1 8~~ 61-7-1

Price, Rack only, . . . 2 1 8

"THE LONGEST LIVED MICROMETER THAT CAN BE BOUGHT"

Slocomb Inside Micrometer Caliper

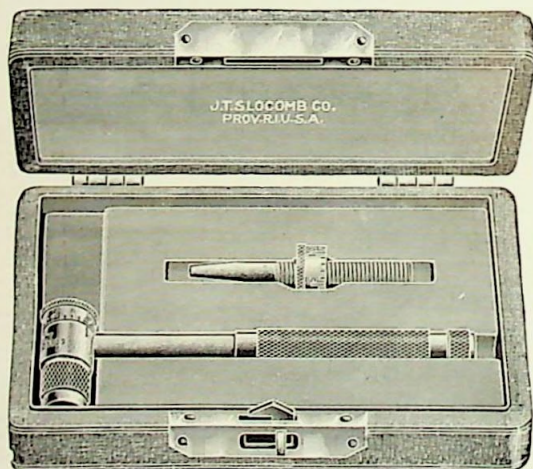


Set No. 101

The Slocomb Inside Micrometer Caliper, as the name indicates, measures accurately inside or internal dimensions. The instrument herein described consists of a set of two micrometers—one measuring internal dimensions from 1/2 to 1 inch, and the other from 1 to 2 inches.

The Slocomb Inside Micrometer is a direct reading instrument giving its readings without the use of an outside micrometer caliper, and is graduated to read directly in thousandths of an inch. By estimation the operator can obtain measurements to one half and one quarter thousandths. This instrument is a rigid measuring device, and its rigidity results in the same being extremely sensitive. Variations in dimensions of not more than one ten thousandth of an inch can be readily detected by its use.

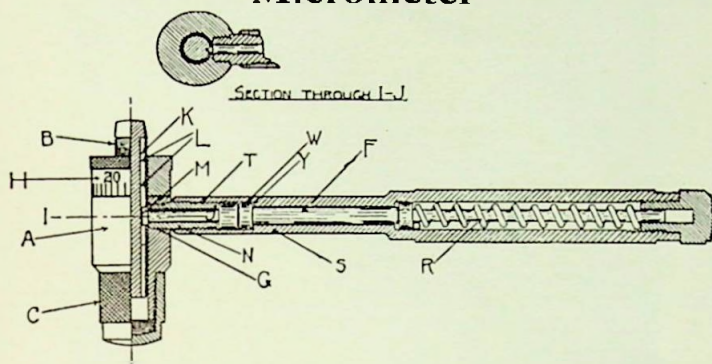
The Slocomb Inside Micrometer Caliper is particularly useful in determining inside measurements, in that it offers facilities for measuring throughout the entire depth of a hole, thus avoiding difficulties or errors where measurements are made only at the edge of a hole. This micrometer is an indispensable tool for tool room work and general machine work in which the requirements call for accuracy in boring, slotting, and grooving, and internal work in general.



Set No. 102

Description of Slocomb Inside Micrometer

37



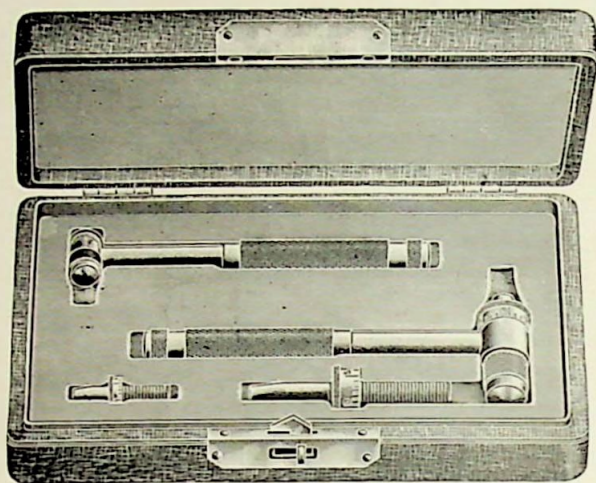
The barrel or body of the instrument A holds the measuring screw B, which telescopes into the same as indicated. The measuring screw is advanced from the barrel by the nut H. C is an adjusting cap fitting on the barrel A and is capable of slight adjustment to compensate for wear. The measuring screw is prevented from rotating when being advanced by the nut by means of the spindle F having a V point M and held in position at the side of the barrel by the bushing N, which is threaded into the barrel at G. This V point meshes into a slot in the measuring screw, and is brought to bear on the measuring screw by means of the spring R held in the chamber of the handle S, which handle is threaded on the bushing N at T. After an adjustment has been made, the measuring screw is locked into position by a right hand rotation of the handle, which causes the shoulder at Y in the same to bear on the collar W, which presses the spindle against the slot in the screw.

There are two screws for each micrometer which are fitted with individual nuts. The range of the short screw for the small micrometer is from $\frac{1}{8}$ inch—.005 to $\frac{1}{4}$ inch. (The range does not extend above or below the limit stated.) The range of the long screw for the small micrometer is from $\frac{3}{8}$ inch—.005 to 1 inch. The range of the short screw for large micrometer is from 1 inch—.005 to $1\frac{1}{2}$ inches. The range of the long screw for large micrometer is from $1\frac{1}{2}$ inches—.005 to 2 inches.

To Make a Measurement

As an example, we will consider a dimension desired which is between 1 and $1\frac{1}{2}$ inches. The larger tool of the set is used and the shorter of the two screws belonging to this tool is inserted.

Grasp the handle of the micrometer between the thumb and forefinger of the right hand and operate the nut with the thumb and forefinger of the left hand. Rotate the nut to the left until it comes nearly in contact with the hardened anvil at the upper end of the screw. The handle is then slightly released and the screw pushed into the barrel with the left forefinger until the same strikes the bottom of the barrel. If the nut has been rotated, as indicated, to the left until the same has very nearly reached the top of the screw, there will be a slight space between the same and the top of the barrel.



Set No. 103

The nut is then rotated in a right hand direction until it comes in contact with the top of the barrel, and a continued rotation of the same for a fraction of a turn will bring the zero of the nut to register with the index line on the barrel. The reading thus obtained is 1 inch exact. The periphery of the nut is graduated into 25 divisions. An advancement of .001 inch is therefore indicated as each graduation of the nut passes the index mark which is on the barrel close to the handle.

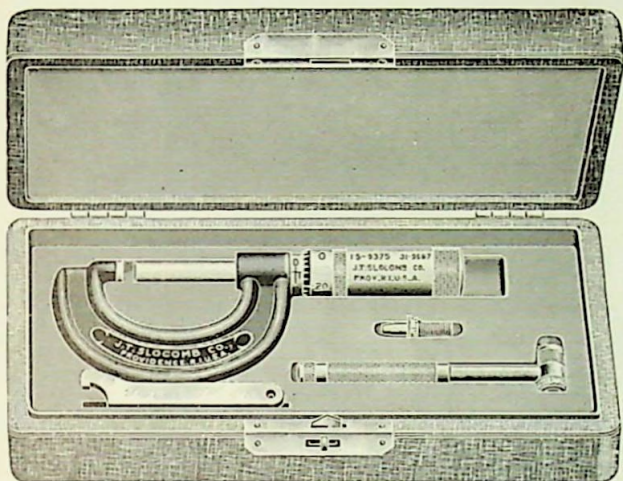
Thus every revolution of the nut advances the screw twenty-five thousandths and, after every fourth revolution, a $\frac{1}{16}$ inch graduation appears in the groove of the measuring screw just above the upper edge of the nut. These $\frac{1}{16}$ inch graduations are indicated at L and are arranged to extend from the bottom of the groove to the top points of the thread. Thus the top of each succeeding thread serves to indicate each single rotation of the nut or an advancement of .025 inch. In adjusting the instrument for a measurement, the final movement of the screw should be made with a right hand rotation of the nut. To lock the screw for a given measurement, the operator further rotates the handle in a right hand direction.

Inserting Screw into Barrel

To make a change in the screw for different ranges of measurement, the screw already in the barrel is removed by unscrewing the handle until the tension is taken off the spring. This allows the screw to be readily removed. In inserting the screw, which is necessary for the desired measurement, care should be taken to adjust the point of the spindle so that the edge of the V is parallel to the axis of the barrel (see illustration). This proper placing of the pin is accomplished by rotating the handle.

The proper method of making a measurement with the Slocomb Inside Micrometer is to rest the adjusting cap on one side of the hole or aperture immovably, and by moving the handle perpendicular to the same "feel" for suitable contact. This will result in the wear coming on the hardened anvil at the end of screw and not on the adjusting cap (also hardened).

Inside Micrometer Calipers 39



Set No. 104

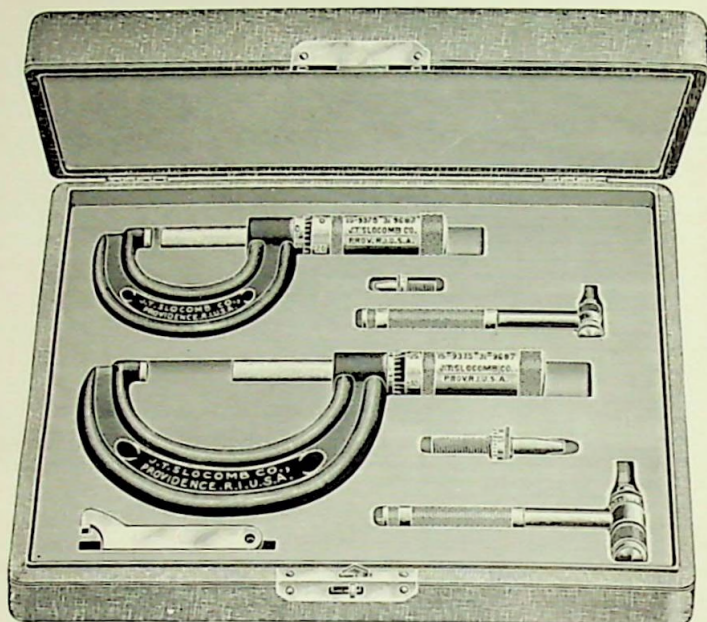
For the convenience of users of these tools we have made them up in sets, some of these sets containing both inside and outside micrometers. These are particularly attractive, as they make a set all of which is furnished complete in a nicely finished morocco-covered, velvet-lined case, and have the tools for measuring either inside or outside always ready for instant use.

These sets are always sent with case complete.

Metric Sizes

When instructed, we can furnish at same prices these inside micrometers for measuring metric sizes, the range being from 13 mm. to 50 mm. The smaller tool covers the range from 13 mm. to 25 mm., and the larger tool from 25 mm. to 50 mm. The above tools are graduated to read in hundredths of a millimetre.

40

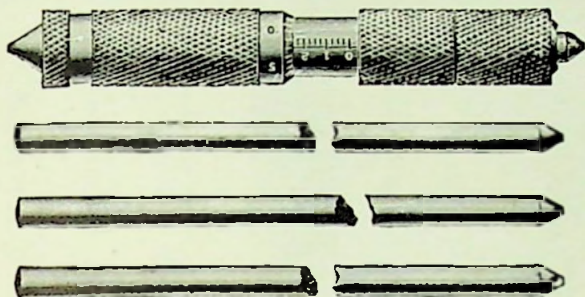


Set No. 106

- | | |
|---|---------------|
| No. 101. Contains 1 Inside Micrometer Handle, with two points for measuring $\frac{1}{2}$ to 1 inch by thousandths of an inch. Complete, in Morocco Case. | 20 10 |
| No. 102. Contains 1 Inside Micrometer Handle, with two points for measuring 1 to 2 inches by thousandths of an inch. Complete, in Morocco Case. | 20 10 |
| No. 103. Contains 2 Inside Micrometer Handles, with two points for each handle for measuring $\frac{1}{2}$ to 2 inches by thousandths of an inch. Complete, in Morocco Case. | 41 8 |
| No. 104. Contains 1 (smaller size) Inside Micrometer Handle, with two points for making inside measurements $\frac{1}{2}$ to 1 inch, also one 1 inch, No. 25, Slocomb Outside Micrometer reading to thousandths of an inch. Complete, in Morocco Case. | 35 5 37 6 |
| No. 105. Contains 1 (larger size) Inside Micrometer Handle, with two points for making inside measurements 1 to 2 inches by thousandths, also one 2 inch, No. 27, Slocomb Outside Micrometer. Complete, in Morocco Case. | 35 5 37 6 |
| No. 106. Contains 2 Inside Micrometer Handles, with two points for each handle for making inside measurements, from $\frac{1}{2}$ to 2 inches inclusive, also one each 1 inch, No. 25, and 2 inch, No. 27, Slocomb Outside Micrometers, all reading to thousandths of an inch. Complete, in Morocco Case. | 70 10 75 0 |

"THE LONGEST LIVED MICROMETER THAT CAN BE BOUGHT"

Inside Micrometer Gauge



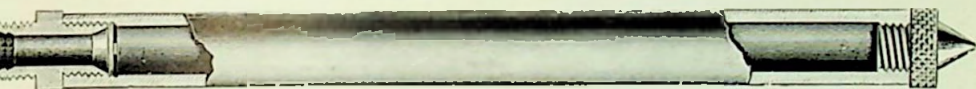
No. 11

The tool when sent out consists of the inside micrometer frame and four rods, 2, $3\frac{1}{2}$, 5, and $6\frac{1}{2}$ inches long. With these any measurements from $2\frac{1}{2}$ to 9 inches diameter can be made.

It should be noticed, however, that this is a reference tool only. By means of an outside micrometer or other means, the tool may be set at any point within its range and actual measurements within a range of $\frac{1}{4}$ inch can then be made from this point with micrometer screw.

Price of Tool with four rods, complete, 7/4

Extra Wires to length specified, 1d. per inch



Micrometer Gauge Extension

Nos. 1 and 2

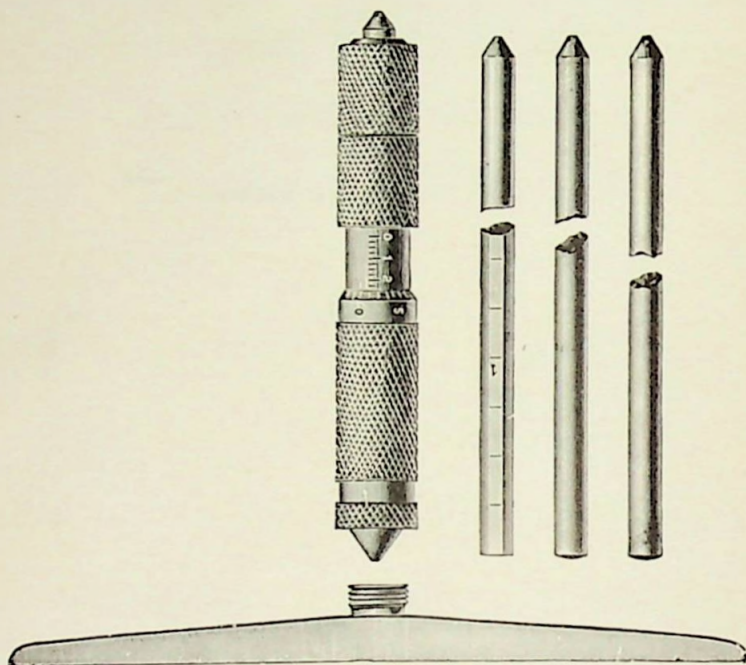
These extensions are for use in connection with our inside micrometers and combination gauges, and are made so as to screw on to the end of the micrometer. For lengths greater than 9 inches they are much better than long rods.

They can be made of most any length but for the matter of convenience we list two lengths which we carry in stock. Any others we can furnish at special prices when desired.

A long rod is furnished with each extension tube which will run through the micrometer and also the extension tube as far as the pointed tip.

- | | |
|--|-----|
| No. 1. Extension is $6\frac{1}{2}$ inches long, and in use with micrometer will measure from 9 to $16\frac{1}{2}$ inches long. | |
| Extension complete, with steel tips and rod, . . . | 4/2 |
| No. 2. Extension is 14 inches long, and in use with micrometer measures from $16\frac{1}{2}$ to 32 inches long. | |
| Extension complete, with steel tips and rod, . . . | 5/3 |

42 Combination Micrometer Gauge



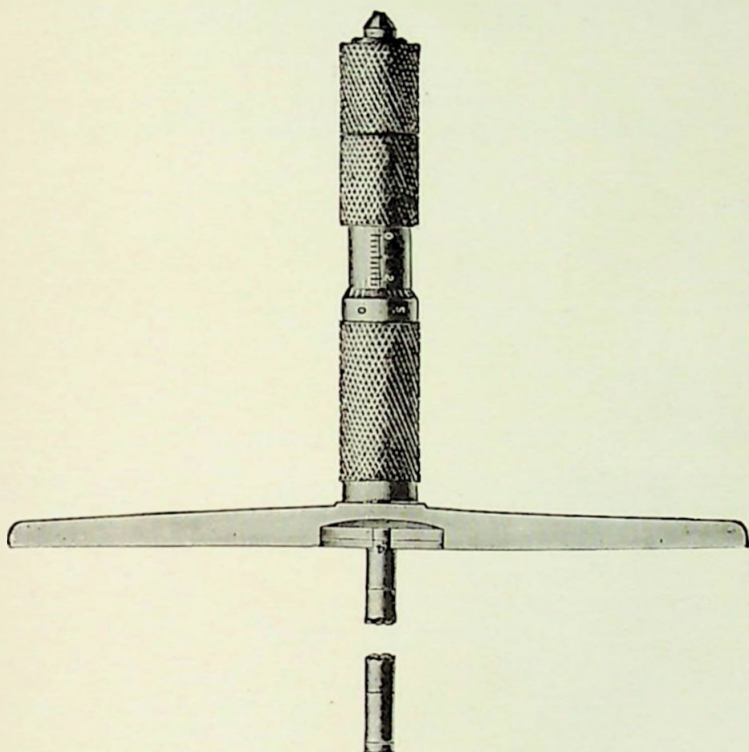
No. 12

The Micrometer body and three plain rods are the same as in our Inside Micrometer Gauge, but the fourth rod is graduated, as shown, in $\frac{1}{4}$ inch divisions for use with the depth gauge attachment. It measures standard as a depth gauge, but only allowances or differences as an inside Caliper.

No. 12. Combination Micrometer Gauge with	
Micrometer body, base, three plain rods, 2, 3 $\frac{1}{2}$,	
and 5 inches long, and one rod 6 $\frac{1}{2}$ inches long	
graduated to $\frac{1}{4}$ inch for 4 inches for depth gauge.	
Complete,	10/5
Above complete in Morocco Case,	13/7
Wire Rod graduated for 6 inches for Depth Gauge,	1/8
Wire Rod graduated for 12 inches for Depth Gauge,	3/4

Prices on other rods on application.

Combination Micrometer Gauge 43



No. 13

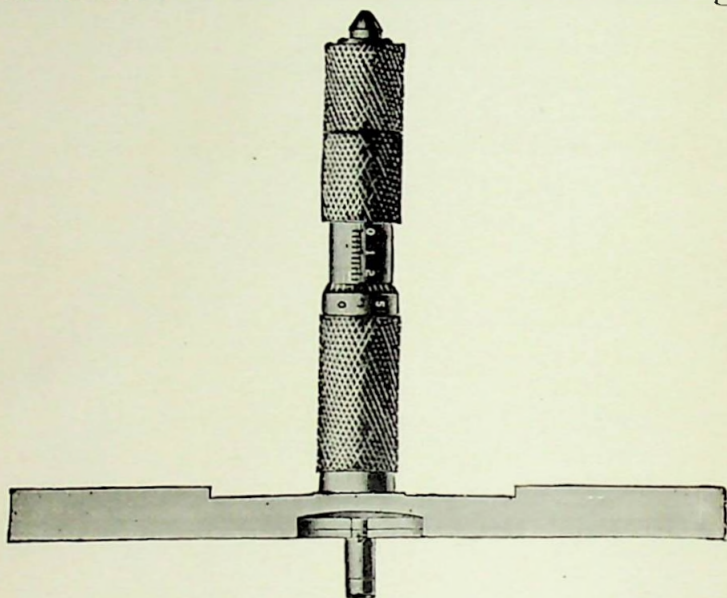
This tool differs from Combination Micrometer Gauge No. 12 only in the graduated rod and line in base to match, the object being to produce most particularly an accurate and convenient depth gauge.

The graduated rod has lines running completely around. It must be fitted to the base in which it is used.

No. 13. Combination Micrometer Gauge with	
Micrometer body, base, three plain rods, 2, 3½,	
and 5 inches long, and one graduated as described above for 4 inch depth gauge. Complete,	
	14/7
Above, complete in Morocco Case,	17/9
Rod for 6 inch Depth Gauge, graduated as above,	4/2
Rod for 12 inch Depth Gauge, graduated as above,	6/3

Prices on other length rods on application.

Combination Micrometer Gauge



No. 14

This tool differs from Combination Micrometer Gauge No. 13 only in its parallel base, which allows of its being used inverted, so as to measure standard heights (as well as depths) above $\frac{1}{4}$ inch, which is the thickness of the base. The base is hardened and accurately ground on both top and bottom.

This tool will be found of value in adjusting planer tools, as it covers about all the ground of a step-height gauge, also measuring all intermediate sizes by thousandths, and to the length of graduated rod. For use as a height gauge on planer work, the body of micrometer can be dropped through a hole in planer platen, or be allowed to overhang the edge of platen or work. The graduated rod must be fitted to the base to which it is used.

No. 14. Combination Micrometer Gauge with

Micrometer body, base, three plain rods, 2, 3 $\frac{1}{2}$,

and 5 inches long, and one rod graduated to

$\frac{1}{4}$ inch for 4 inch Depth Gauge. Complete,

18 9

Above, complete in Morocco Case,

22/-

Rod for 6 inch Depth Gauge, graduated,

4 2

Rod for 12 inch Depth Gauge, graduated,

6 3

Standard End Measures



These End Measures are particularly designed for testing micrometers and keeping them properly adjusted. Micrometers should be tested often, and by doing so can be kept in proper condition at all times.

Sizes to 12 inches inclusive are made from tool-steel, .310 diameter, large sizes, $\frac{7}{16}$ inch diameter. Ends are carefully hardened, ground, and lapped. To avoid changes in temperature due to handling, the rods are protected by a piece of rubber tubing.

These same End Measures are furnished with sets Nos. 20, 22, 24, 26 and 28, as listed on pages 31 to 35 inclusive.

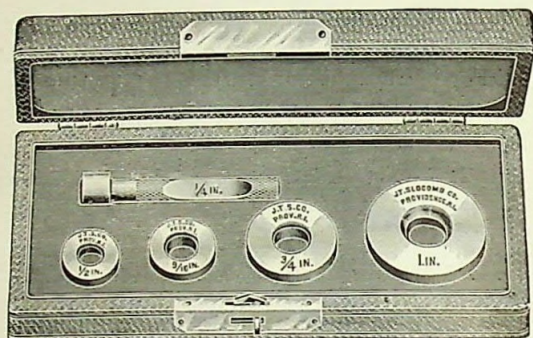
Metric Measure

We can furnish, when so instructed, End Measures of Metric measure lengths at same prices as English End Measures.

English Measure.	Metric Measure.	Price.	English Measure.	Metric Measure.	Price.
1	25	3 2	13	325	9 5 13-7
2	50	4 2	14	350	10 5 14-7
3	75	4 7 5-0	15	375	11 6 15-8
4	100	5 5 5-10	16	400	12 6 16-8
5	125	5 5 6-8	17	425	13 7 17-9
6	150	5 10 7-6	18	450	14 7 18-9
7	175	6 3 8-4	19	475	16 8 20-10
8	200	6 8 9-2	20	500	18 9 22-11
9	225	7 1 10-0	21	525	20 10 25-0
10	250	7 6 10-10	22	550	22 1 27-1
11	275	7 11 11-8	23	575	25 2 29-2
12	300	8 4 12-5	24	600	27 1 31-3

46

Standard Reference Disc Set



No. 80

This set of Reference Discs is put out for the purpose of properly testing a 1 inch micrometer. From the fact that this size micrometer is for measuring sizes down to 0 it is especially desirable to have the micrometer accurate throughout the entire length of travel of the screw.

With this set the screw can be tested every quarter inch of travel and also on the half turn at $\frac{1}{16}$ to test whether the face of screw and anvil are perpendicular to axis of thread on screw.

No. 80 set contains one each Standard Reference Disc $\frac{1}{2}$, $\frac{3}{4}$, $\frac{7}{8}$, 1 and $1\frac{1}{4}$ inch. All contained in genuine Morocco-covered Case.

No. 80 Set, complete, 25/-

Standard Reference Discs

47



The discs in this assortment are made from tool-steel—hardened very hard, and finished to the highest accuracy, and are intended for reference. The set consists of 29 sizes, $\frac{1}{16}$ to 2 inches inclusive, by $\frac{1}{16}$ inch. The first two sizes are made solid with handle attached, and there are four detachable handles for the larger sizes. Discs from $\frac{9}{16}$ to $1\frac{1}{2}$ inches are $\frac{1}{4}$ inch thick, $1\frac{3}{16}$ to 2 inches are $\frac{5}{16}$ inch thick.

When purchased in sets they are furnished in a genuine morocco-covered case lined with velvet. Steel plugs attached to bottom of case support each disc, and each plug is stamped on top with size to correspond with size of disc to be kept in that place. In this way each disc is plainly in view and ready for use.

Price of Set, complete, £6 13 4

Prices of Single Discs

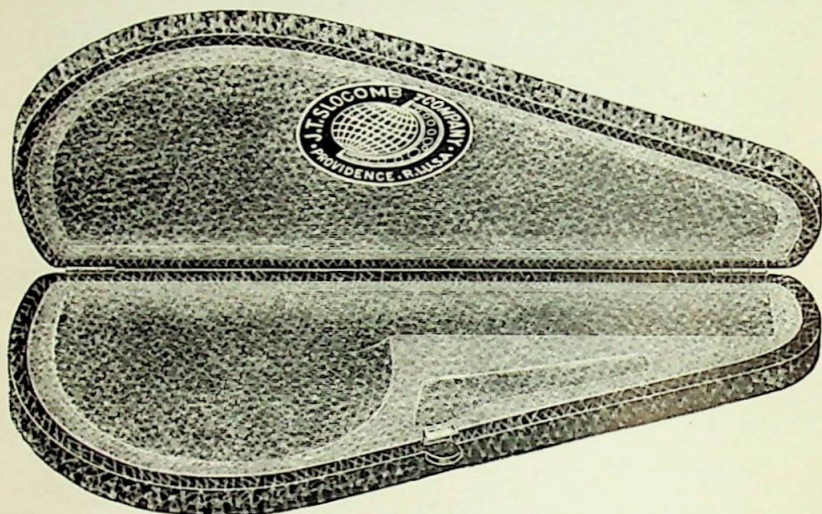
* $\frac{1}{16}$ in. 6 3	$\frac{3}{16}$ in. 4 5	$1\frac{3}{16}$ in. 4 7	$1\frac{5}{8}$ in. 5 10
* $\frac{3}{16}$ in. 6 3	$\frac{1}{4}$ in. 4 5	$1\frac{1}{2}$ in. 4 7	$1\frac{11}{16}$ in. 5 10
$\frac{1}{2}$ in. 3 9	$\frac{5}{8}$ in. 4 5	$1\frac{3}{4}$ in. 5 3	$1\frac{13}{16}$ in. 5 10
$\frac{3}{4}$ in. 3 9	$\frac{7}{8}$ in. 4 5	$1\frac{7}{8}$ in. 5 3	$1\frac{15}{16}$ in. 6 6
$1\frac{1}{16}$ in. 4 2	1 in. 4 7	$1\frac{9}{16}$ in. 5 3	$1\frac{17}{16}$ in. 6 6
$\frac{9}{16}$ in. 4 2	$1\frac{1}{16}$ in. 4 7	$1\frac{11}{16}$ in. 5 3	$1\frac{19}{16}$ in. 6 6
$\frac{11}{16}$ in. 4 2	$1\frac{3}{8}$ in. 4 7	$1\frac{13}{16}$ in. 5 10	2 in. 6 6

Sizes marked * are furnished with handles.

Prices of Handles

$\frac{3}{8}$ to $\frac{1}{2}$ in. 2 9	$\frac{9}{16}$ to $\frac{5}{8}$ in. 2 9	$\frac{11}{16}$ to 1 in. 3 2	$1\frac{1}{16}$ to 2 in. 3 2
--	---	--------------------------------------	--------------------------------------

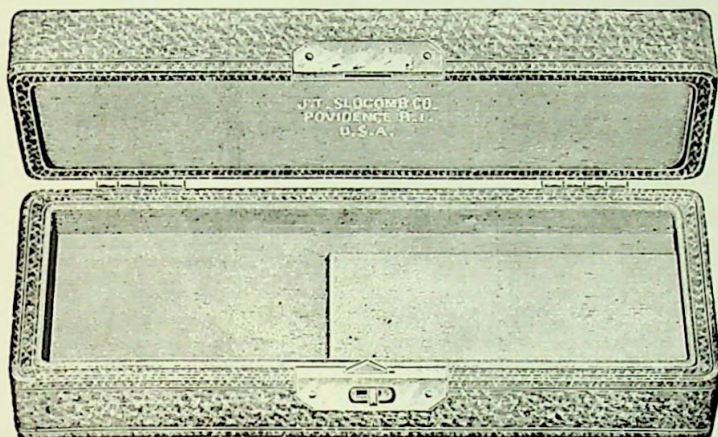
48 New Style Micrometer Cases



Many wish to carry a micrometer in their pocket and yet find it inconvenient to do so as the cases that have been on the market so many years are so bulky as to make it almost impossible; and, if the tool is carried loose, it is far more apt to accumulate dirt and dust. The new style cases listed on this page are designed to overcome this, as even the three inch case can be carried in the pocket with ease. Even though the cases are kept in the tool chest, they are of advantage because of taking up so little space.

Cases are lined with velvet and leather covered.

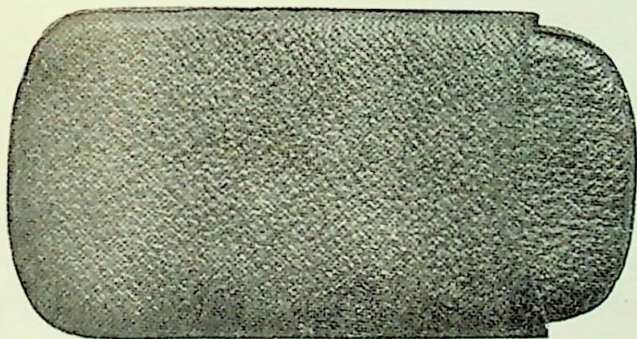
No. 40.	For $\frac{1}{2}$ inch Micrometer,	. . . . .	2/1
No. 41.	For 1 inch Micrometer,	. . . . .	3/2
No. 42.	For 2 inch Micrometer,	. . . . .	4/2
No. 43.	For 3 inch Micrometer,	. . . . .	4/2



Morocco Cases

These cases are genuine morocco covered, lined with velvet and made for service. We believe they will be found very attractive for holding the different micrometers.

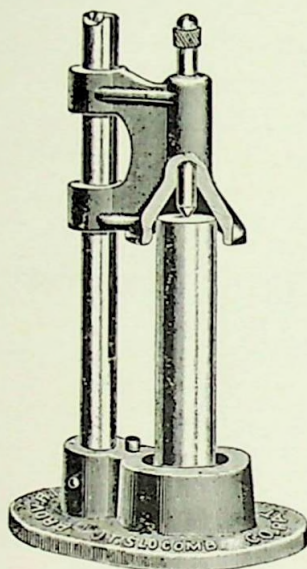
- | | |
|---------------------------------------|---------------------------------------|
| No. 61. For 1 inch Micrometers, $3/2$ | No. 66. For 6 inch Micrometers, $9/5$ |
| No. 62. For 2 inch Micrometers, $4/2$ | No. 18. For 1, 2, and 3 inch |
| No. 63. For 3 inch Micrometers, $4/2$ | Micrometers, upright, $5/3$ |
| No. 64. For 4 inch Micrometers, $7/4$ | No. 21. For 1, 2, and 3 inch |
| No. 65. For 5 inch Micrometers, $8/4$ | Micrometers, flat, $5/3$ |



One Half-inch Caliper Case

A telescopic all-leather case. Very neat and convenient for carrying the $\frac{1}{2}$ inch micrometer in the pocket. Price, $1/1$

Severance Centring Tool



PATENTED, JANUARY 25, 1898.

The Severance Centring Tool, in connection with our Combination Centre Drills, makes a very good means of centring small lathe work. When stock is cut off in the lathe, or similar way, and the ends are fairly true, this Centring Tool will do accurate and rapid work.

They are made in one size, covering diameters from $\frac{5}{16}$ to $1\frac{1}{2}$ inches, and lengths of 12 inches.

The bell centre punch is arranged to slide on the splined upright, and is prevented from turning by a key, set in its bore, which fits the spline in the upright. A small rubber plug is inserted in a hole in the base-plate for the sliding head to drop on.

Price, 8/4

Machinists' Sets

51

Semi-High Speed Steel Combination Centre Drills



Believing that machinists would be interested in a set of centre drills which were contained in a case and thus always ready for use, sets have been made up as shown above.

These cases are covered with paper, same colour as that on the Micro-meter and Drill boxes, and have an attractive appearance.

The set contains one each A, B, C, D, E, H, F, and G Drills as shown on the following page. These cover the range of sizes which experience of many years in this business has shown us to be the sizes most in demand.

The Centre Drills are all made of a semi-high speed steel, same as those which we list elsewhere, and will do a large amount of hard and accurate work.

A tool chest equipment is not complete without a set of these.

Price, 4/2 per set.

Semi-High Speed Steel Combination Centre Drill



Being the first to place this tool on the market, The J. T. Slocomb Co. continue to feel particularly interested in making them the best. They have accomplished this by first studying the requirements and making a tool which from all practical points is suited for the work to which it is put, and second by using a steel which has proved its ability to make a drill which will do a large amount of work. This is a semi-high speed steel made especially for their use in these tools, and from their investigation they have found this to be the most suitable for making a combination centre drill that will produce the most accurate results and do the greatest amount of work.

These Combination Centre Drills in sets are listed on previous page.

Number.	Diameter of Body.	Diameter of Drill Points.	Decimal Diameter of Drill Points.	Price, per Dozen.
S	$\frac{1}{8}$	No. 57	.043	6/3
*H	$\frac{3}{32}$	$\frac{3}{32}$	.0468	6/3
M	$\frac{1}{16}$	No. 55	.052	6/3
L	$\frac{1}{8}$	$\frac{1}{16}$ - No. 45	.0625 .082	6/3
*E	$\frac{1}{16}$	$\frac{1}{16}$	.0625	6/3
O	$\frac{1}{8}$	No. 49 - No. 45	.073 .082	6/3
*D	$\frac{1}{16}$	$\frac{1}{16}$	.078	6/3
*A	$\frac{3}{16}$	$\frac{3}{32}$ - $\frac{1}{8}$	.0938 .125	6/3
*B	$\frac{1}{8}$	$\frac{1}{8}$	.125	6/3
*C	$\frac{3}{16}$	$\frac{3}{16}$	.0938	6/3
*F	$\frac{7}{16}$	$\frac{7}{16}$	.1563	12/6
*G	$\frac{7}{8}$	$\frac{7}{8}$	.1875	12/6
R	$\frac{1}{16}$	$\frac{3}{32}$ - $\frac{3}{16}$	.1563 .1875	12/6

* Those drills marked with an asterisk (*) before the letter are sizes which we have found to be the best, and these sizes we recommend.

These Combination Centre Drills should be run at a speed suitable for the drill regardless of the countersink.

Semi-High Speed Steel Combined Drills and Countersinks



The sizes listed below are similar in pattern to the combination centre drills listed on the preceding page and are made of the same quality of steel.

They are used not only for centring lathe work, but in many instances are used for drilling and countersinking a hole at the same time, such as drilling and countersinking tyres.

Those using these combined drills and countersinks will obtain the same satisfactory service from them as those who have used our centre drills have obtained and the sort of service that has made our centre drill so well known.

Number.	Diameter of Body.	Diameter of Drill Points.	Decimal Diameter of Drill Points.	Price, per Dozen.
1	1/2	3/32	.2187	19/2
2	1 1/4	3/16	.2812	19/2
3	1 1/2	1/8	.3437	20/10
4	1 3/4	3/16	.4062	20/10
5	2	1/4	.2187	30/3
6	2 1/4	9/32	.2812	30/3
7	2 1/2	1/2	.3437	32/4
8	2 3/4	1 1/8	.4062	32/4
9	3	1 1/4	.2500	39/7
10	3 1/4	1 3/8	.3125	39/7

These Combination Centre Drills should be run at a speed
suitable for the drill regardless of the countersink.

Slocomb Semi-High Speed Steel Combination Centre Drills

A centre bearing on point, as shown here at **B**, has caused much loss; loss in bad work, aggravation, and delay, and all for the want of a little care in drilling the centres, or, what is better, Combination Centre Drills, which do the work without close attention.

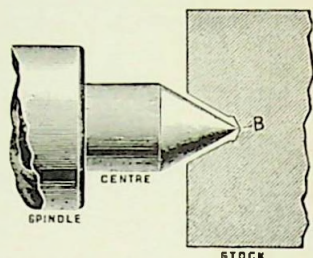


Fig. 1.

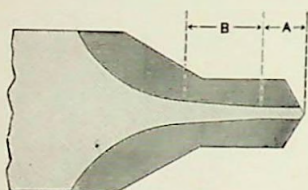


Fig. 2.

Fig. 2 represents a section much enlarged through the point of our centre drill.

Thickness **A** in centre of drill remains the same as far as grinding is supposed to go, then thickness at **B** for strength in throat.

Some who have used these drills did not get the best results on account of the way they were handled.

Speed and feed should suit the drill regardless of countersink.

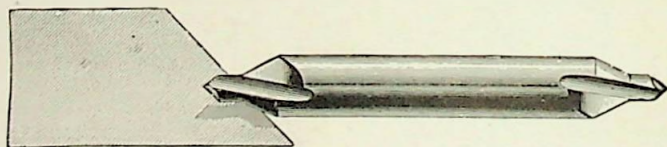


Fig. 3.

The above illustration represents a Combination Centre Drill starting a hole at quite a sharp angle to the surface.

In an experience of several years in light tool making, we have found these drills of much value for such work.

When the small drill gets fairly started, it acts the same as the teat on a counterbore and prevents the countersink running off, so when the hole is countersunk sufficiently to allow the large drill to enter, that drill will start properly.

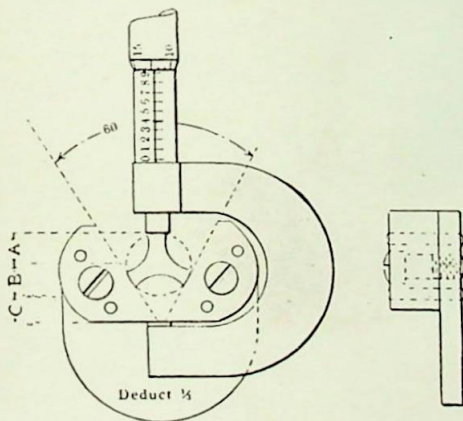
Measuring Three-Fluted Tools with the Micrometer 55

The sketch shows a V block or gauge for measuring three-fluted drills, counterbores, &c.

The angle being 60 degrees, the distances **A**, **B**, and **C** are equal. Consequently to determine the correct diameter of the piece to be measured, apply the gauge as indicated in the sketch and deduct one third of the total measurement.

The use of this gauge is a decided advantage over the old way of soldering on a piece of metal opposite a tooth or boring out a ring to fit to.

Using a standard 60 degree triangle for setting and a few different sizes of standard cylindrical plug gauges for testing, the V block may be easily and very accurately made.



From the American Machinist Hand Book, by F. H. Colvin and F. A. Stanley, McGraw Hill Book Company, New York.

56 How to Read a Micrometer

A Micrometer is very easily read, but of course, like many other things, rapid work is obtained only after some practice.

Many machinists read the Micrometer almost at a glance.

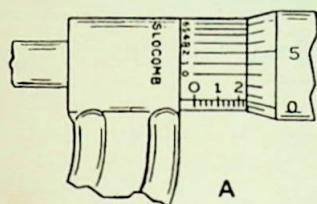
Our Caliper is made with a 40 pitch screw which, of course, will advance .025 inch per revolution, or require five revolutions to advance .125 inch, which is equal to $\frac{1}{8}$ inch. There is a revolution line cut upon the sleeve which forms the support of the screw. This revolution line runs parallel with axis of screw, and, in combination with the zero line on end of thimble, is used to indicate whole turns of screws.

The end of the thimble is graduated into 25 divisions, and as a whole revolution advances the screw .025 inch, then turning the thimble one division advances the screw .001 inch. The end of the thimble is further divided by long lines into five equal parts, which are numbered for convenience in reading.

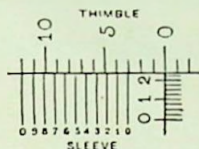
The cross graduating, adjoining the revolution line, is simply for convenience in counting the revolutions of screw, thus: if there are three of these divisions exposed and the zero line on thimble corresponds with the revolution line, the screw has made exactly three revolutions; or if there are three divisions exposed and the thimble does not stand at zero, then there is an additional fractional part of a revolution, and the exact fractional part is read from the graduated end of thimble. If the screw has gone three turns and the line on thimble numbered five matches the revolution line, then three revolutions at .025 inch per revolution equals .075 inch and adding the .005 inch read from the thimble, we have .080 inch, the amount the Caliper stands open.

For convenience in reading, and in reckoning the number of turns of screw, every fourth line of the cross graduating is extended at the upper side of the revolution line and numbered to denote the amounts of opening at these complete revolutions, thus: at the cross line numbered 5, the 5 indicates an opening of $\frac{5}{16}$ or .500 inch, which equals $\frac{1}{2}$ inch, then if the thimble does not stand at zero its reading must be added to this.

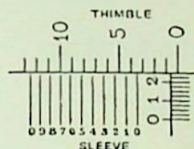
In the Slocomb Caliper, in addition to what is common, every fifth line of the cross line is extended graduating on the lower side of revolution line, and numbered from 1 to 8. These fifth lines indicate every fifth revolution of screw and equal eighths of an inch, so that if the user chooses he need not use decimals except for measurements within eighths.



A



B



C

When desired, we can furnish micrometers graduated to read in ten thousandths (.0001).

How to read Micrometers Graduated to Ten Thousandths

Readings in ten thousandths of an inch are obtained by means of divisions marked on sleeve of the micrometer called a Vernier.

There are ten of these divisions on the sleeve occupying the same space that nine divisions on the thimble occupy, and are numbered 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 0. The difference between the width of one of the ten spaces on the sleeve and one of the nine spaces on the thimble is one tenth of a space on the thimble or one ten thousandth of an inch.

In Figure B the third line from 0 on thimble coincides with the first line on the sleeve. The next two lines do not coincide by one tenth of a space on the thimble, the next two marked 5 and 2 are two tenths apart, and so on. When the micrometer is opened the thimble is turned to the left and each space on the thimble represents a thousandth of an inch. Therefore when the thimble is turned so that the lines 5 and 2 coincide the micrometer is opened two tenths of one thousandth or two ten thousandths. If the thimble be turned further so that the line 10 coincides with the line 7 on the sleeve as in Figure C the micrometer has been opened seven ten thousandths.

To Read the Micrometer

Note the thousandths as usual, then observe the number of divisions on the Vernier until a line is reached which coincides with a line on the thimble. If it is the second line marked 1, add one ten thousandth; if the third marked 2, add two ten thousandths, &c.

It is not advisable to use micrometers graduated to ten thousandths where fine measurements are not required, as a wear, although it be of comparatively slight consequence in a micrometer that reads only to thousandths, is perceptible and important when making these fine measurements.

Table of Millimetre Equivalents of Parts of an Inch

Inch	mm.	Inch	mm.
1-64.....	.397	33-64.....	13.097
1-32.....	.794	17-32.....	13.494
3-64.....	1.191	35-64.....	13.890
1-16.....	1.587	9-16.....	14.287
5-64.....	1.984	37-64.....	14.684
3-32.....	2.381	19-32.....	15.081
7-64.....	2.778	39-64.....	15.478
1-8.....	3.175	5-8.....	15.875
9-64.....	3.572	41-64.....	16.272
5-32.....	3.969	21-32.....	16.669
11-64.....	4.366	43-64.....	17.065
3-16.....	4.762	11-16.....	17.462
13-64.....	5.159	45-64.....	17.859
7-32.....	5.556	23-32.....	18.256
15-64.....	5.953	47-64.....	18.653
1-4.....	6.350	3-4.....	19.050
17-64.....	6.747	49-64.....	19.447
9-32.....	7.144	25-32.....	19.844
19-64.....	7.541	51-64.....	20.240
5-16.....	7.937	13-16.....	20.637
21-64.....	8.334	53-64.....	21.034
11-32.....	8.731	27-32.....	21.431
23-64.....	9.128	55-64.....	21.828
3-8.....	9.525	7-8.....	22.225
25-64.....	9.922	57-64.....	22.622
13-32.....	10.319	29-32.....	23.019
27-64.....	10.716	59-64.....	23.415
7-16.....	11.113	15-16.....	23.812
29-64.....	11.509	61-64.....	24.209
15-32.....	11.906	31-32.....	24.606
31-64.....	12.303	63-64.....	25.003
1-2.....	12.700	1.....	25.400

Table of Decimal Equivalents of Millimetres and Fractions of Millimetres

$$\frac{1}{100} \text{ mm.} = .0003937 \text{ Inch}$$

mm.	Inch.	mm.	Inch.	mm.	Inch.
1-50	.00079	26-50	.02047	2	.07874
2-50	.00157	27-50	.02126	3	.11811
3-50	.00236	28-50	.02205	4	.15748
4-50	.00315	29-50	.02283	5	.19685
5-50	.00394	30-50	.02362	6	.23622
6-50	.00472	31-50	.02441	7	.27559
7-50	.00551	32-50	.02520	8	.31496
8-50	.00630	33-50	.02598	9	.35433
9-50	.00709	34-50	.02677	10	.39370
10-50	.00787	35-50	.02756	11	.43307
11-50	.00866	36-50	.02835	12	.47244
12-50	.00945	37-50	.02913	13	.51181
13-50	.01024	38-50	.02992	14	.55118
14-50	.01102	39-50	.03071	15	.59055
15-50	.01181	40-50	.03150	16	.62992
16-50	.01260	41-50	.03228	17	.66929
17-50	.01339	42-50	.03307	18	.70866
18-50	.01417	43-50	.03386	19	.74803
19-50	.01496	44-50	.03465	20	.78740
20-50	.01575	45-50	.03543	21	.82677
21-50	.01654	46-50	.03622	22	.86614
22-50	.01732	47-50	.03701	23	.90551
23-50	.01811	48-50	.03780	24	.94488
24-50	.01890	49-50	.03858	25	.98425
25-50	.01969	1	.03937	26	1.02362

10 mm. = 1 centimetre = 0.3937 inch.

10 cm. = 1 decimetre = 3.937 inch.

10 dm. = 1 metre = 39.37 inch.

25.4 mm. = 1 English inch.

English Inches into Millimetres

Inch	0	1-16	1-8	3-16	1-4	5-16	3-8	7-16	1-2	9-16	5-8	11-16	3-4	13-16	7-8	15-16
0	0.0	1.6	3.2	4.8	6.4	7.9	9.5	11.1	12.7	14.3	15.9	17.5	19.1	20.6	22.2	23.8
1	25.4	27.0	28.6	30.2	31.7	33.3	34.9	36.5	38.1	39.7	41.3	42.9	44.4	46.0	47.6	49.2
2	50.8	52.4	54.0	55.6	57.1	58.7	60.3	61.9	63.5	65.1	66.7	68.3	69.8	71.4	73.0	74.6
3	76.2	77.8	79.4	81.0	82.5	84.1	85.7	87.3	88.9	90.5	92.1	93.7	95.2	96.8	98.4	100.0
4	101.6	103.2	104.8	106.4	108.0	109.5	111.1	112.7	114.3	115.9	117.5	119.1	120.7	122.2	123.8	125.4
5	127.0	128.6	130.2	131.8	133.4	134.9	136.5	138.1	139.7	141.3	142.9	144.5	146.1	147.6	149.2	150.8
6	152.4	154.0	155.6	157.2	158.8	160.3	161.9	163.5	165.1	166.7	168.3	169.9	171.5	173.0	174.6	176.2
7	177.8	179.4	181.0	182.6	184.2	185.7	187.3	188.9	190.5	192.1	193.7	195.3	196.9	198.4	200.0	201.6
8	203.2	204.8	206.4	208.0	209.6	211.1	212.7	214.3	215.9	217.5	219.1	220.7	222.3	223.8	225.4	227.0
9	228.6	230.2	231.8	233.4	235.0	236.5	238.1	239.7	241.3	242.9	244.5	246.1	247.7	249.2	250.8	252.4
10	254.0	255.6	257.2	258.8	260.4	261.9	263.5	265.1	266.7	268.2	269.9	271.5	273.1	274.6	276.2	277.8
11	279.4	281.0	282.6	284.2	285.7	287.3	288.9	290.5	292.1	293.7	295.3	296.9	298.4	300.0	301.6	303.2
12	304.8	306.4	308.0	309.6	311.1	312.7	314.3	315.9	317.5	319.1	320.7	322.3	323.8	325.4	327.0	328.6
13	330.2	331.8	333.4	335.0	336.5	338.1	339.7	341.3	342.9	344.5	346.1	347.7	349.2	350.8	352.4	354.0
14	355.6	357.2	358.8	360.4	361.9	363.5	365.1	366.7	368.3	369.9	371.5	373.1	374.6	376.2	377.8	379.4
15	381.0	382.6	384.2	385.8	387.3	388.9	390.5	392.1	393.7	395.3	396.9	398.5	400.0	401.6	403.2	404.8
16	406.4	408.0	409.6	411.2	412.7	414.3	415.9	417.5	419.1	420.7	422.3	423.9	425.4	427.0	428.6	430.2
17	431.8	433.4	435.0	436.6	438.1	439.7	441.3	442.9	444.5	446.1	447.7	449.3	450.8	452.4	454.0	455.6
18	457.2	458.8	460.4	462.0	463.5	465.1	466.7	468.3	469.9	471.5	473.1	474.7	476.2	477.8	479.4	481.0
19	482.6	484.2	485.8	487.4	488.9	490.5	492.1	493.7	495.3	496.9	498.5	500.1	501.6	503.2	504.8	506.4
20	508.0	509.6	511.2	512.8	514.3	515.9	517.5	519.1	520.7	522.3	523.9	525.5	527.0	528.6	530.2	531.8
21	533.4	535.0	536.6	538.2	539.7	541.3	542.9	544.5	546.1	547.7	549.3	550.9	552.4	554.0	555.6	557.2
22	558.8	560.4	562.0	563.6	565.1	566.7	568.3	569.9	571.5	573.1	574.7	576.3	577.8	579.4	581.0	582.6
23	584.2	585.8	587.4	589.0	590.5	592.1	593.7	595.3	596.9	598.5	600.1	601.7	603.2	604.8	606.4	608.0

39.37 in. = 1 m. = 10 dm. = 100 cm. = 1000 mm. 24.00 in. = 0.6096 m. 1 yd. = 0.9144 m. 1 mile = 1609.3 m.

Making Proper Allowances for Various Classes of Fits

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The question often occurs how much allowance to make for a certain kind of a fit. If the fit must be a tight one, forced or shrunk together, the shaft must be larger than the bore. If the hub is of soft and tough metal, such as soft steel or bronze, and is thin, it is evident that some allowance must be made for the stretching of metal in hub. If the surfaces are rough, rough turning and rough boring, some allowance must be made for the flattening down of these rough surfaces. Then again, the bore and shaft are often out of round and not axially true. A shaft that is out of round is often larger than it measures, also a bore that is not axially straight appears smaller than it is in a running fit. Cored holes bored by various kinds of reamers only are liable to be crooked on account of tools springing and so following, to some extent, direction of core. For this reason, as a rule, a long bearing in a running fit requires more allowance than a short one. Where surfaces are hard and perfectly true and smooth, as in Standard Plug and Ring Gauges, very small allowances suffice.

The following table of allowances will be found useful for good average machine work :—

Force Fits (for Shafts)	Driving Fits (for Shafts)
Up to $\frac{1}{2}$ in. + .0005 to .001	+ .0004 to .0006
$\frac{1}{2}$ in. to 1 in. + .001 to .003	+ .0004 to .001
1 in. to 2 in. + .002 to .004	+ .00075 to .002
2 in. to 3 in. + .003 to .006	+ .0015 to .003
3 in. to 4 in. + .005 to .008	+ .002 to .004
4 in. to 5 in. + .006 to .010	+ .002 to .0045
5 in. to 6 in. + .008 to .012	+ .003 to .005
Push Fits	Running Fits
Up to $\frac{1}{2}$ in. — .00025 to .00075	— .00075 to .0015
$\frac{1}{2}$ in. to 1 in. — .0005 to .001	— .001 to .002
1 in. to 2 in. — .0005 to .0015	— .0015 to .0025
2 in. to 3 in. — .0005 to .0015	— .0015 to .003
3 in. to 4 in. — .00075 to .002	— .002 to .0035
4 in. to 5 in. — .00075 to .002	— .0025 to .004
5 in. to 6 in. — .00075 to .002	— .0025 to .0045

Constants

To be used in connection with J. T. Slocomb Company's Screw Thread Micrometer Caliper

Subtract from the outside diameter the decimal given as a constant for the number and form of thread used, and you obtain the correct thread micrometer reading.

Example : To find thread micrometer reading for $\frac{1}{2}$ -13 U. S. S.
 $\frac{1}{2}$ inch = .500. Constant for 13 U. S. S. threads is .0499.
 $.500 - .0499 = .4501$ (thread micrometer reading).

No.	V.	U.S.S.	Whitworth.	No.	V.	U.S.S.	Whitworth.
80	.0108	.0081	.0080	24	.0361	.0271	.0266
72	.0120	.0090	.0088	22	.0393	.0295	.0290
64	.0135	.0101	.0100	20	.0433	.0325	.0320
62	.0140	.0105	.0103	18	.0481	.0361	.0355
60	.0144	.0108	.0106	16	.0541	.0406	.0400
58	.0149	.0112	.0110	14	.0619	.0464	.0457
56	.0155	.0116	.0114	13	.0666	.0499	.0492
54	.0160	.0120	.0118	12	.0722	.0541	.0533
52	.0167	.0125	.0123	11 $\frac{1}{2}$	.0753		
50	.0173	.0130	.0128	11	.0787	.0590	.0582
48	.0180	.0135	.0133	10	.0866	.0649	.0640
46	.0188	.0141	.0139	9	.0962	.0721	.0711
44	.0197	.0148	.0145	8	.1082	.0812	.0800
42	.0206	.0155	.0152	7	.1237	.0928	.0914
40	.0217	.0162	.0160	6	.1443	.1082	.1066
38	.0228	.0171	.0168	5 $\frac{1}{2}$	.1574	.1180	.1163
36	.0241	.0180	.0177	5	.1732	.1299	.1280
34	.0255	.0191	.0188	4 $\frac{1}{2}$	.1924	.1443	.1422
32	.0271	.0203	.0200	4	.2165	.1624	.1600
30	.0289	.0217	.0213	3 $\frac{1}{2}$	.2474	.1855	.1828
28	.0309	.0232	.0228	3 $\frac{1}{4}$	.2664	.1998	.1969
26	.0333	.0250	.0246	3	.2886	.2165	.2133

A. S. M. E. is same as U. S. S.

Formulas

Thread Micrometer reading for V threads = $D - \frac{.866}{P}$

Thread Micrometer reading for U. S. S. threads = $D - \frac{.6495}{P}$

Thread Micrometer reading for Whitworth threads = $D - \frac{.640}{P}$

Thread Micrometer reading for A. S. M. E. threads = $D - \frac{.6495}{P}$

Decimal Equivalent of the Numbers of Twist Drill and Steel Wire Gauge

No.	Size of No. in Decimals.	No.	Size of No. in Decimals.	No.	Size of No. in Decimals.	No.	Size of No. in Decimals.	No.	Size of No. in Decimals.
1	.2280	17	.1730	33	.1130	49	.0730	65	.0350
2	.2210	18	.1695	34	.1110	50	.0700	66	.0330
3	.2130	19	.1660	35	.1100	51	.0670	67	.0320
4	.2090	20	.1610	36	.1065	52	.0635	68	.0310
5	.2055	21	.1590	37	.1040	53	.0595	69	.0292
6	.2040	22	.1570	38	.1015	54	.0550	70	.0280
7	.2010	23	.1540	39	.0995	55	.0520	71	.0260
8	.1990	24	.1520	40	.0980	56	.0465	72	.0250
9	.1960	25	.1495	41	.0960	57	.0430	73	.0240
10	.1935	26	.1470	42	.0935	58	.0420	74	.0225
11	.1910	27	.1440	43	.0890	59	.0410	75	.0210
12	.1890	28	.1405	44	.0860	60	.0400	76	.0200
13	.1850	29	.1360	45	.0820	61	.0390	77	.0180
14	.1820	30	.1285	46	.0810	62	.0380	78	.0160
15	.1800	31	.1200	47	.0785	63	.0370	79	.0145
16	.1770	32	.1160	48	.0760	64	.0360	80	.0135

64 Speed Recommended for Twist Drills

Diameter of Drills.	Speed for Wrought Iron and Steel.	Speed for Cast Iron.	Speed for Brass.	Diameter of Drills	Speed for Wrought Iron and Steel.	Speed for Cast Iron.	Speed for Brass.
Inches.				Inches.			
1-16	1712	2383	3544	1 1-16	72	108	180
1-8	855	1191	1772	1 1-8	68	102	170
3-16	571	794	1181	1 3-16	64	97	161
1-4	397	565	855	1 1-4	58	89	150
5-16	318	452	684	1 5-16	55	84	143
3-8	265	377	570	1 3-8	53	81	136
7-16	227	323	489	1 7-16	50	77	130
1-2	183	267	412	1 1-2	46	74	122
9-16	163	238	367	1 9-16	44	71	117
5-8	147	214	330	1 5-8	40	66	113
11-16	133	194	300	1 11-16	38	63	109
3-4	112	168	265	1 3-4	37	61	105
13-16	103	155	244	1 13-16	36	59	101
7-8	96	144	227	1 7-8	33	55	98
15-16	89	134	212	1 15-16	32	53	95
1	76	115	191	2	31	51	92

These speeds should seldom be exceeded, except for Oil Drills and Drills made of high speed steel. Feed per revolution for $\frac{1}{8}$ inch Drill, about .005 inch; for $\frac{1}{4}$ inch Drill, about .007 inch; for $\frac{3}{8}$ inch Drill, .010 inch.

Combination Centre Drills for centring lathe work should be run at a suitable speed for the drill point, regardless of countersink. We find it is often the case that these drills are run at a suitable speed for drills, size of large diameter or countersink, which is altogether too slow. The B Drill with $\frac{1}{8}$ inch point should be run about 850 per minute, the E Drill with $\frac{1}{16}$ inch point at about 1700. Feed should not exceed that for a small drill of this diameter.

Table of Decimal Equivalents

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Inch.		Inch.	
1-640156	33-645156
1-320313	17-325313
3-640469	35-645469
1-160625	9-165625
5-64 . . . . .	.0781	37-64 . . . . .	.5781
3-32 . . . . .	.0938	19-32 . . . . .	.5938
7-64 . . . . .	.1094	39-64 . . . . .	.6094
1-8 . . . . .	.1250	5-8 . . . . .	.6250
9-64 . . . . .	.1406	41-64 . . . . .	.6406
5-32 . . . . .	.1563	21-32 . . . . .	.6563
11-64 . . . . .	.1719	43-64 . . . . .	.6719
3-16 . . . . .	.1875	11-16 . . . . .	.6875
13-64 . . . . .	.2031	45-64 . . . . .	.7031
7-32 . . . . .	.2188	23-32 . . . . .	.7188
15-64 . . . . .	.2344	47-64 . . . . .	.7344
1-4 . . . . .	.2500	3-4 . . . . .	.7500
17-64 . . . . .	.2656	49-64 . . . . .	.7656
9-32 . . . . .	.2813	25-32 . . . . .	.7813
19-64 . . . . .	.2969	51-64 . . . . .	.7969
5-16 . . . . .	.3125	13-16 . . . . .	.8125
21-64 . . . . .	.3281	53-64 . . . . .	.8281
11-32 . . . . .	.3438	27-32 . . . . .	.8438
23-64 . . . . .	.3594	55-64 . . . . .	.8594
3-8 . . . . .	.3750	7-8 . . . . .	.8750
25-64 . . . . .	.3906	57-64 . . . . .	.8906
13-32 . . . . .	.4063	29-32 . . . . .	.9063
27-64 . . . . .	.4219	59-64 . . . . .	.9219
7-16 . . . . .	.4375	15-16 . . . . .	.9375
29-64 . . . . .	.4531	61-64 . . . . .	.9531
15-32 . . . . .	.4688	31-32 . . . . .	.9688
31-64 . . . . .	.4844	63-64 . . . . .	.9844
1-2 . . . . .	.5000	1	1.0000



